Draft
Response Action Sampling and Analysis Plan
for
PacifiCorp Property
Salt Lake City, Utah

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Prepared for:
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Section 1
Introduction

This document serves as the response action sampling and analysis plan (RASAP) for the cleanup efforts as part of the response action work plan (RAWP) for the PacifiCorp Property (also known as the 3rd West Substation). This RASAP outlines the sampling and analysis to be conducted during cleanup of contaminated soil and interior LA dust cleaning at the site.

This section provides a general explanation of the purpose of the RASAP for the RAWP and organization of this document. An expanded site background is available (3rd West Substation Site History Report, dated March 26, 2004); a brief history is provided in Section 2.
The cleanup activities being completed at the PacifiCorp Property include the removal of residual dust and contaminated soil from an Electrical Substation structure and surrounding soils. The contamination encountered at the property is due to historic vermiculite processing, handling and transportation. The approach to the actual cleanup of these media is found in the text of the RAWP located in the main body of this document.
During cleanup of the properties, sampling and analysis is conducted to ensure the contaminated material is removed to the cleanup criteria and to ensure the health and safety of the workers at the site and the public in the vicinity of the site. This includes sampling and analysis following removal of contaminated dust for clearance of the building structure being cleaned and following removal of contaminated soils to confirm that the contamination is removed from the excavation area; sampling will also be conducted during the removal of contaminated soil to ensure safety of the workers and the public is maintained throughout the cleanup.

This RASAP outlines the field sampling plan as it pertains to sampling completed during and after soil excavation and interior cleaning. The purpose of this RASAP is to describe the sampling objectives, locations, measurement methods, and the quality assurance (QA) requirements for sampling of the soil and air during cleanup efforts. The RASAP is organized as follows:

Section 1 - Introduction
Section 2 - Site Background

Part I: Field Sampling Plan (FSP)
Section 3 - Sampling Strategy, Locations, and Rationale
Section 4 - Field Activity Methods and Procedures

Part II: Quality Assurance Project Plan (QAPP)
Section 5 - Project Management
Section 6 - Measurement and Data Acquisition
Section 7 - Assessment and Oversight
Section 8 - Data Validation and Usability
Section 9 - References
Appendix A-1 - Standard Operating Procedures
Appendix A-2 - Air Sample Collection Procedures
Appendix A-3 - Request for Modification Forms

1.1 Objectives

This section defines objectives of the soil and air confirmation, air monitoring, and the intended use of the data. The primary objective of these efforts is to determine the

presence of LA during and after soil excavation and dust removal at the PacifiCorp Property. The specific objectives are to:

- Sampling during removal - confirmation soil sampling to ensure remaining media meets cleanup standards listed in the RAWP
- Sampling during removal - stationary air sampling to ensure that excavation is not spreading asbestos into the air
- Sampling after removal - stationary air and confirmation soil sampling to ensure what remains meets cleanup standards as defined by EPA and listed in the draft RAWP document
- Sampling throughout dust removal/excavation - breathing zone air sampling, a health and safety measure, to ensure workers are not being exposed to asbestos
- Sampling will be ongoing for the duration of the cleanup activities at the site, which are anticipated to last several months.

1.2 Project Schedule and Deliverables

During removal operations, the results of the RASAP will be placed in the property cleanup files at the on-site office in Salt Lake City, Utah and maintained by PacifiCorp/R&R. Other project deliverables and schedules are discussed in the RAWP for this work (The main body of this document).

Section 2
Site Background

This section describes the site location and the history.

2.1 Site Location

The PacifiCorp Property is located at 147 South 400 West, Salt Lake City in Salt Lake County, Utah (Figure 1-1 in the RAWP). The site includes energized high voltage electrical equipment typical of an electric utility distribution substation. Certain areas of the property are contaminated with asbestos fibers as a result of historic vermiculite handling and processing conducted in the area in years past.

2.2 Site History

A detailed history of the PacifiCorp Property site is available in a document entitled "3rd West Substation Site History Report", dated March 26, 2004. A portion of the PacifiCorp property and other nearby sites served as a transfer point and processing (expansion) area for vermiculite from Libby, Montana. Expansion (also known as "exfoliation" or "popping") was accomplished by heating the ore, usually in a dry kiln, to approximately 2,000 degrees Fahrenheit (°F). This process explosively vaporizes the water contained within the phyllosilicate structure causing the vermiculite to expand by a factor of 10 to 15. This produces the vermiculite material most commonly sold as thermal insulation and as soil conditioner for gardens and greenhouses. The commercially exploited vermiculite was used in a variety of products, including insulation and construction materials, as a carrier for fertilizer and other agricultural chemicals, and as a soil conditioner.

According to Andrew Schneider and David McCumber, in "An Air that Kills: How the Asbestos poisoning of Libby, Montana uncovered a National Scandal", Libby Amphibole (LA) is a combination of rare asbestiform minerals that formed when a plume of magma rose up from the earth's mantle, pushed through the sedimentary deposits of the area, stopping about a mile below the surface. As the plume and subsequent plumes cooled, biotite was formed. Biotite is an unstable mineral, which, because of the abundant water available, metamorphosed into tremolite asbestos and other LA suite minerals. After tens of millions of years, vermiculite formed due to erosion and weathering.

Part I: Field Sampling Plan

Section 3
Sampling Strategy, Locations, and Rationale

The field sampling plan (FSP) is included in Sections 3 and 4. This section describes the overall strategy for sampling conducted during cleanup activities.

3.1 Sampling Strategy

All soil within the demarcated contaminated area will be excavated to the minimum depth of 12 inches; in the "pit" area (where deeper contamination was found) excavation may go as deep as 8 feet. Excavation may be terminated at shallower depths if sampling indicates no contamination. This will be determined by the R&R HSM. Following the excavation of the contaminated soils within the demarcated area, the R&R onsite representative will inspect the sidewalls and bottom of the excavation. If there is vermiculite in large quantities still visible in the excavation, the cleanup/construction contractor will be directed to remove additional contaminated soil until, in the judgment of the R&HSM, the remaining soils are expected to meet soil clearance criteria or a depth of three feet has been reached. At that point, the R&R HSM will collect confirmation soil samples.

3.1.1 Soil Confirmation

A confirmation sample will consist of a five-point composite (five sub samples submitted as one sample) surface (0 to 2 inches) soil sample covering an area where contaminated soil has been removed. It will be at the discretion of the R&R onsite representative to decide how many samples will characterize the area being excavated. The number of confirmation samples collected daily will be dictated by the size of the excavation and progress of the cleanup/construction contractor. In general, at least one composite sample will be collected for every 625 square feet of excavation area. Soil sample collection procedures are discussed in Section 4.

3.1.2 Stationary Air Monitoring

During contaminated soil removal, the perimeter of the exclusion zone will be monitored for asbestos fiber migration by collecting stationary air samples at the exclusion zone boundaries. Daily perimeter monitoring will be conducted in calm weather at the compass points (north, east, south and west).

3.1.3 Personal Breathing Zone Monitoring

Personal breathing zone (BZ) air samples will be collected on personnel conducting contaminated dust and soil removal to document that the level of respiratory protection is adequate for the task being conducted. Sampling frequencies for personal BZ air monitoring shall be a minimum of 25% of the removal work force.

3.2 Quality Assurance/Quality Control (QC) Samples

The QA/QC measures taken for confirmation soil and clearance air sampling include analysis of field and/or laboratory QC samples, verification of analytical results through alternative methods, and laboratory systems audits and performance monitoring through the National Voluntary Laboratory Accreditation Program (NVLAP). Laboratory QA/QC must adhere to method requirements unless defined differently in this RASAP. At the discretion of the EPA On-Scene Coordinator (OSC), data generated by polarized light microscopy (PLM) may be verified through alternative analytical methods, which are currently being developed by EPA in a performance evaluation study. If at any point this step is required, direction will be provided in the form of an addendum memorandum or modification form to this RASAP. Individual QA/QC requirements for each sample type are described below. Note that QC samples will not be used in decision making for site cleanup; rather, QC samples will only be used to assess the precision and accuracy of the field sampling and analysis efforts and to understand whether biases exist in the data as a result.

Confirmation Soil Sample QC

Individual QA/QC requirements for confirmation soil samples are:

Field Duplicates. Due to the need for expedited soil sample results, field duplicates are not required for the removal action program.

Performance Evaluation Samples. Performance evaluation (PE) samples may be inserted into the confirmation soil sample train to independently assess analytical accuracy. If at any point this step is implemented, direction on required frequency, acceptance criteria, corrective action will be provided in the form of an addendum memorandum or modification form to this RASAP.

Sample Preparation. Following receipt at the analytical laboratory, soil confirmation samples will be thoroughly homogenized then split. One sample split will be analyzed by the laboratory and the other returned under strict chain of custody to R&R for archival.

3.3 Clearance (Confirmation) Air Sample QC

Individual QA/QC requirements for air samples taken as part of the clearance assessment are defined below and summarized in Table 3-1:

Lot Blanks. Lot blanks are prepared by submitting unused cassettes for analyses prior to putting the group (lot) of cassettes into use. Lot blanks will be collected and analyzed at a frequency of 2 per 100 cassettes from the same lot. The lot blanks will be analyzed by each of the following methods: NIOSH 7400 and TEM AHERA. Lot blanks will be identified on the chain-of-custody (COC) form, so that the analytical laboratory is aware of their use and can contact the laboratory coordinator immediately if asbestos fibers are detected on the filters. If the lot is proved to be contaminated with 7 or more fibers per cubic millimeter by NIOSH 7400, or 1 or more LA structures per square millimeter by TEM AHERA, then the lot of cassettes will be discarded and a new lot of cassettes will be used.

Field blanks should be divided into two categories, those relating to clearance (confirmation) air samples and those relating to other air samples including breathing zone and stationary monitoring. Regardless of the type of field blank, they are all collected by removing the cap from the sample cassette at the time of sampling for not more than 30 seconds and then replacing the cap.

Field Blanks, Clearance Air Samples. 2 field blanks will be collected per work zone (i.e., removal area). The field blanks will come from the same lot as the cassettes used that day for air sample collection. Both of the field blanks will be collected in the removal area, but in the vicinity of the location the ambient air samples are collected. The field blanks will be analyzed by TEM AHERA. If a field blank is contaminated with 1 or more LA structures per square millimeter, then the HSM will determine whether the occurrence displays a trend in contamination or is isolated. The HSM will also decide whether analysis of other archived field blanks is necessary. If it is determined that additional archived field blanks require analysis, they will be retrieved from archive at the analytical laboratory and analyzed. Field blank results will be evaluated to determine if field blank contamination is a sample collection procedure deficiency. If at any time field blank contamination appears to be a consistent deficiency in sample collection technique, PacifiCorp or R&R may immediately recommend additional formalized sample collection training and/or an increase in the frequency of field blanks submitted for analysis. If this is implemented, direction on required frequency, acceptance criteria, and corrective action will be provided in the form of an addendum memorandum or modification form to this RASAP.

Field Blanks, Breathing Zone/Stationary Air Monitoring Samples. One field blank will be collected per day of air sampling. The field blank cassettes will come from the same lot as the cassettes used that day for air sample collection. One field blank will be analyzed per week. The remainder of the field blanks collected, but not analyzed, will be submitted to the analytical laboratory marked for archive. The field blanks will be analyzed by each of the following methods: NIOSH 7400 for breathing zone monitoring field blanks or TEM AHERA for stationary monitoring field blanks. The field blanks sample results will be

reviewed by the HSM. If a field blank is contaminated with 7 or more fibers per cubic millimeter by NIOSH 7400, or 1 or more LA structures per square millimeter by TEM AHERA, then the HSM will determine whether the occurrence displays a trend in contamination or is isolated. The HSM will decide whether analysis of other archived field blanks is necessary. If
it is determined that additional archived field blanks require analysis, they will be retrieved from archive at the analytical laboratory and analyzed. Field blank results will be evaluated to determine if field blank contamination is a sample collection procedure deficiency. If at any time field blank contamination appears to be a consistent deficiency in sample collection technique, PacifiCorp or R&R may immediately recommend additional formalized sample collection training and/or an increase in the frequency of field blanks submitted for analysis. If this is implemented, direction on required frequency, acceptance criteria, and corrective action will be provided in the form of an addendum memorandum or modification form to this RASAP.

Table 3-1 QC Sample Requirements for Clearance (Confirmation) Air Samples

QC Sample	Air Sample Type	Frequency	Acceptance Criteria (b)	Corrective Action
Lot Blank	Final Clearance Personal Breathing Zone Stationary	2 per 100 cassettes of the same lot number (a)	1. Analyze & apply acceptance criteria prior to ever using the cassettes for sample collection. 2. <7.0 f/mm3 (method detection limit using NIOSH 7400) 3. ND for LA (TEM AHERA with site-specific modifications)	Do not use the lot of cassettes for sampling if acceptance criteria are not met.
Field Blank	Final Clearance	2 per work area - 2 field blanks collected per NPE, one will be analyzed and one will be archived	ND for LA (TEM AHERA with site-specific modifications)	Analyze archived blank to determine if contamination on first blank is an isolated occurrence. If the contamination in the field blank does not appear to be a trend, no action is required. If a trend in contamination is apparent, re-train the sampler(s) and continue to monitor the problem until resolved. Field blanks contaminated with LA will be considered when determining if the work area meets final clearance criteria (i.e., if re-cleaning and clearing the work area is warranted).

Field Blank	Breathing Zone Perimeter Monitoring	1 per day of air sampling	1. <7.0 f/mm2 (Method Detection Limit using NIOSH 7400) (b) 2. ND for LA (TEM AHERA with site-specific modifications)	Evaluate the field blank results to determine if contamination is an isolated occurrence. If the contamination in the field blank does not appear to be a trend, no action is required. If a trend in contamination is apparent, re-train the sampler(s) and determine if an increase in the frequency of field blanks analyzed is required. Associated field sample results may be qualified. If necessary, other field blanks collected by the samper should be retrieved from archive and analyzed.

f/mm2 fibers per square millimeter
ND non-detect for Libby Amphibole
NPE negative pressure enclosure
(a) Frequency requirements are based on the lot number, not on the air sample type.
(b) Acceptance criterion is based upon calculations that assume 5.5 fibers per 100 fields analyzed by NIOSH 7400

Section 4

Field Activity Methods and Procedures

The following is a summary of field activities that will be performed by R&R personnel for soil and air sampling:

- Mobilization
- Procurement of equipment and supplies
- Documentation of field activities
- Photographic documentation
- Field sampling methods and procedures
- Decontamination procedures

4.1 Mobilization

Prior to the mobilization for field activities, a field planning meeting will be conducted by the HSM and attended by the contractor and consultant. The agenda will be reviewed and approved by the PacifiCorp PM prior to the meeting. The meeting will be to briefly discuss and clarify:

- Objectives and scope of the fieldwork
- Equipment and training needs
- Field operating procedures, schedules of events, and individual assignments
- Required QC measures
- Health and safety requirements
- Documents governing fieldwork that must be on site
- Any changes in the field plan documents

A written agenda, reviewed by the QAM, will be distributed and an attendance list signed. Copies of these documents will be maintained in the project files. Additional meetings will be held when the documents governing fieldwork require it or when the scope of the assignment changes significantly.

The field team personnel will perform the following activities before and during field activities, as applicable:

- Review and understand the FSP and comprehensive site health and safety plan (CSHASP)
- Ensure that all sample analyses are scheduled through the designated laboratory
- Obtain required sample containers and other supplies
- Locate hospital
- Obtain and check field sampling equipment
- Obtain personal protective equipment (PPE)
- Turn samples with chain of custody over to the QA manager or the HSM

4.2 Equipment, Supplies, and Sample Containers

The equipment listed below will be required for sampling activities.

Soil Sampling:

- Potable water/distilled water

- Digital camera

4.3 Field Documentation

Information and notations will be recorded as required in the applicable field logbook. In addition, field sample data sheets (FSDSs) will be completed for each sample in order to capture pertinent tracking information, such as sample date and time, specific location, and logbook reference, for entry into the PacifiCorp project database. To ensure that sample information is consistent and retrievable from the site and database, all field sampling personnel will be instructed on proper FSDS completion by the HSM prior to field work.

4.4 Field Instrument Calibration and Maintenance

No field measurements will be collected during this inspection and, therefore, no field instruments will be used.

4.5 Photographic Documentation

Photographs will be taken with a digital camera at each sample location and at any place that the field sampling personnel determine necessary. Electronic photo files will be saved each day to a project-designated computer housed on-site and named so that photos for a particular activity (e.g., bulk substrate removal, interior dust removal, etc.) can easily be retrieved. The photo file naming convention is as follows:

PacifiCorp_3rdW_RM_Inside_Prep_22_110404

Where:

PacifiCorp_3rdW is the address where removal activities occurred
RM designates a removal-related photo (versus other phases of project work)
Inside defines the phase of work (as opposed to "Outside")
Prep (preparation) defines the activity being documented
22 designates the number of the photo taken at that property that day
071504 designates the date (mmddyy) the photo was taken

Following completion of removal activities, all photo files pertaining to a property will be copied onto a CD and filed along with other property-specific documentation.

4.6 Field Sampling Methods and Procedures

This section provides a list of SOPs, including project-specific SOPs. The project specific procedure will be followed during this removal project. For additional information, field personnel will refer to the SOPs included in Appendix A-1 and Appendix A-2 provides procedures specific to air sample collection). The CSHASP should be consulted to determine health and safety protocols for performing site work. Prior to initiating field activities, the HSM will review and discuss the RASAP and CSHASP with the contractor and consultant. The contents of each Appendix are listed below.

Field Activity methods and Procedures

Appendix A-1 – R&R Standard Operating Procedures (R&R 2002a:

- Sample Custody (SOP 1-2)
- Surface Soil Sampling (Modified SOP 1-3)
- Packaging and Shipping of Environmental Samples (Modified SOP 2-1)
- Guide to Handling of Inspection-Derived Waste (Modified SOP 2-2)
- Field Logbook Content and Control (SOP 4-1)
- Photographic Documentation of Field Activities (Modified SOP 4-2)
- Field Equipment Decontamination at Non-Radioactive Sites (Modified SOP 4-5)
- Completion of Field Sample Data Sheets (FSDS) (project-specific SOP)
- Electronic Chain-of-Custody (project-specific SOP)

Appendix A-2– Air Sample Collection Procedures:

- EPA SOP 2015; 11/17/94 Revision 0.0, for calibration of all air samples and stationary air sample collection

- 29 CFR 1926.1101 Appendix B; Sampling and Analysis - Non-mandatory, for personal breathing zone air sample collection
  TEM AHERA (40CFR Part 763 Subpart E), for final clearance air sample collection

Appendix C — Request for Modification Form:

- Record of Deviation/Request for Modification Form

4.7 Decontamination Procedures

Sampling methods have been selected to reduce the amount of equipment that needs to be decontaminated (i.e., by choosing either dedicated or disposable items). If a piece of equipment needs to be used to collect more than one sample (i.e., comes into contact with more than one sample material), that piece of equipment will be decontaminated in accordance with R&R SOP 4-5, Field Equipment Decontamination at Non-radioactive Sites with modification and confirmation soil sampling procedures (Appendix A-1).

Part II: Quality Assurance Project Plan

Section 5
Project Management

This RASAP supports the draft RAWP for the PacifiCorp site. This RASAP was prepared in accordance with EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Final (EPA 2001). This section covers the basic area of project management, including the project organization, background and purpose, project description, quality objectives and criteria, special training, and documentation and records. Appendix A-1 includes a copy of applicable R&R SOPs (R&R 2002b) while Appendix A-2 includes air sample collection procedures.

5.1 Project Organization

Organization and responsibilities specific to this removal action are discussed in this section. R&R will provide the necessary technical and field staff to perform sampling and reporting aspects of the project. Analytical services are provided through a contract laboratory.

5.1.1 EPA Region VIII

The EPA on-scene coordinator (OSC), Mr. Floyd D. Nichols, is PacifiCorp's primary federal agency contact for coordinating response action work at the PacifiCorp Property. Mr. Nichols, as OSC, is responsible for the management and coordination of the following activities:

- Defining the scope of the draft response action
- Defining data quality objectives
- Reviewing all project deliverables
- Maintaining communications with the PacifiCorp project manager for updates on the status of the response action activities
- Provide for technical review and the return of consolidated comments on the various technical documents submitted for review
- Act as the lead Federal agency at the site

5.1.2 PacifiCorp

The PacifiCorp project manager (PM), Mr. David Wilson, is the primary contact for coordinating response action work at the PacifiCorp Property. Mr. Wilson is responsible for the management and coordination of the following activities:

- Defining the sampling scope
- Defining data quality objectives
- Reviewing all project deliverables
- Reviewing monthly status reports
- Providing oversight of the sampling
- Assuring that plans are implemented properly
- Informing personnel of any special considerations associated with the project
- Providing site access, if necessary
- Reviewing work progress for each task
- Reviewing and analyzing overall performance with respect to goals and objectives

5.1.3 R&R Environmental, Inc. (R&R)

The R&R management team will be comprised of the following positions: Health and Safety Manager (HSM) and project Quality Assurance Manager (QAM).
The following personnel are assigned to this project:
Health and Safety Manager David Roskelley
Quality Assurance Manager Eldon Romney

Mr. Roskelley, as HSM, is responsible for the overall management and coordination of the following activities:

- Maintaining communications with EPA and PacifiCorp regarding the status of this project
- Supervising production and review of deliverables
- Reviewing analytical results
- Tracking of planned budgets and schedules
- Procuring non-laboratory subcontractors, when necessary
- Providing oversight of data management
- Using sampling data in site remediation decision making
- Preparing monthly status reports
- Reviewing analytical results
- Overseeing operation and maintenance activities
- Scheduling personnel and material resources
- Providing oversight of daily and periodic report preparation
- Coordinating work activities including sampling
- Notifying the responsible QA staff immediately of significant problems affecting
- the quality of data or the ability to meet project objectives
- Implementing field aspects of the project, including this RASAP and other project
- documents
- Organizing and conducting periodic meetings with onsite facility personnel
- Implementing the QC measures specified in R&R's Quality Management Plan
- (QMP) (R&R 2003a) and other project documents
- Implementing corrective actions resulting from staff observations, QA/QC
- surveillances, and/or QA audits
- Ensuring that sampling is conducted in accordance with pertinent R&R SOPs and that the quantity and location of all samples meet the requirements of this RASAP
- Scheduling and conducting required sampling and monitoring activities
- Preparing and shipping samples to the analytical laboratories
- Ensuring electronic data entry from FSDSs into the onsite sample tracking database
- Generating COC forms and ensuring adherence to sample custody procedures (e.g.,
- use of custody seals by the samplers)
- Coordinating with the laboratories regarding sample deliveries/shipments and
- following up with result reporting
- Receiving and distributing air monitoring and soil confirmation sample results to The PM,
- the OSC and removal oversight personnel, as applicable

Mr. Roskelley is also responsible for ensuring transmittal of project documentation to PacifiCorp and to the project file repositories.

Mr. Roskelley will:

Ensure the work is conducted according to this document

Conduct soil sampling and air sampling per the RAWP and in accordance with procedures presented herein

Ensure all work will be conducted in accordance with the site-specific HASP that governs the field activities outlined in this RASAP

Be responsible for ensuring that the protocols specified in the HASP are carried out during field activities

Ensure that copies of the HASP are maintained at the Site at all times

Supervise the upgrading or downgrading of the level of protection in accordance with the HASP, based on the existing site conditions

Conduct an initial health and safety meeting, providing an overview of the HASP to all assigned field personnel, and have them sign a form to indicate they understand the content of the HASP document and will adhere to its specifications

Function as the R&R health and safety coordinator (for issues that arise during field activities) and the laboratory coordinator, responsible for the procurement of laboratories subcontracted by R&R

Ensure that all laboratories meet project requirements for data reporting

serve as the database manager for the onsite sample tracking database and be responsible for the development and maintenance of the onsite database to ensure project tracking needs are met

5.1.4 Quality Assurance Organization

The QA Manager, Mr. Eldon Romney, implements the QA program. The QAM is independent of the technical staff and is the president of R&R. The QAM thus has the authority to objectively review projects and identify problems and the authority to use corporate resources as necessary to resolve any quality-related problems. Mr. Romney is also responsible for the following:

- Verifying that corrective actions resulting from staff observations, QA/QC surveillances, and/or QA audits are implemented
- Reviewing and approving the project-specific plans
- Directing the overall project QA program
- Maintaining QA oversight of the project
- Reviewing QA sections in project reports, as applicable
- Reviewing QA/QC procedures applicable to this project
- Auditing selected activities of this project performed by R&R and contractors, as necessary
- Initiating, reviewing, and following up on response actions, as necessary
- Maintaining awareness of active projects and their QA/QC needs
- Determining appropriate QA/QC measures and corrective actions
- Conducting internal system audits to check on the use of appropriate QA/QC measures, if applicable
- Arranging performance audits of measurement activities, as necessary
- Providing monthly written reports on QA/QC activity to the PM

5.1.5 Report Organization

This RASAP is organized in accordance with EPA QA/R-5 guidance for preparing RASAP (EPA 2001). This section (Section 5) presents project management and introductory information. Section 6 provides guidance for measurement and data acquisition. Section 7 describes assessment and oversight aspects of the project, and Section 8 describes data validation and usability issues. References are provided in Section 9.

5.2 Background and Purpose

Site background and a description of the **process equipment and structures** are provided in Section 2 of this RASAP. The purpose and objectives of this project are discussed in Section 1.1 of this RASAP. The purpose of this RASAP is to provide guidance to ensure that all environmentally related data collection procedures and measurements are scientifically sound and of known, acceptable, and documented quality and conducted in accordance with the requirements of the project.

5.3 Project Description

A description of this project is provided in Section 1 of this RASAP. Samples will be analyzed for parameters listed in Section 5.4. Sampling activities and all associated procedures are described in detail in this RASAP.

5.4 Quality Objectives and Criteria for Measurement

This section provides internal means for control and review of the project so that environmentally related measurements and data collected are of known and acceptable quality. The subsections below describe the data quality objectives (DQOs) (Section 5.4.1) and data measurement objectives (Section 5.4.2).

5.4.1 Data Quality Objectives

To accomplish the project goals, the RAWP/RASAP calls for the sampling and analysis of a variety of media for various purposes. For convenience and to clarify the specific purpose of each sampling and analysis program, the DQOs are organized separately by medium and respective purpose. Whenever possible, this is accomplished in tabular form. As shown, the various DQOs are segregated into the following: (1) Soil
Confirmation Samples, (2) Personal Air (BZ) Samples, (3) Perimeter Monitoring Air Samples, (4) Air Confirmation for Indoor Dust Removal.

Step 1: State the Problem
Identify the planning team members including the decision makers:

All project personnel are detailed in Section 5.1. The decision makers for the activities described in this RASAP are Floyd Nichols (EPA OSC), David Wilson (PacifiCorp PM), and David Roskelley (HSM).

Describe the problem:

Previous studies were designed to characterize LA contamination at residential and commercial properties in and around Libby, Montana. Removal activities were performed at residential and commercial properties that were found to contain LA asbestos-contaminated VCI, interior dust, and/or exterior soils. During removal activities on those properties
(i.e., excavation of contaminated soil), the potential for LA fibers to migrate offsite increased. Likewise, during those activities, the potential for LA exposure to workers also increased. This experience indicates it is important to ensure worker safety and contaminant containment through periodic monitoring. Following cleanup, confirmation samples must be collected and analyzed expeditiously to determine if the removal actions met
project goals. Therefore, a program must be put in place to monitor: (1) worker exposure and contaminant containment during removal activities; and (2) the effectiveness of the cleanup (i.e., confirmation) following removal activities.

Determine resources:

R&R's current task order under PacifiCorp provides a detailed description of resources, budget, and schedule for sampling and analysis response activities.

Step 2: Identify the Decision

Identify the principle study question, alternative actions, and decision statements:
The principle study question(s), alternative actions, and decision statements are summarized in Table 5-1.

Table 5-1 Identify the Decision

Data Quality Objective	Sample Description	Principle Study Question(s)	Alternative Actions	Decision Statements
RA Monitoring	Personal (BZ) Air Monitoring	Is LA detected in the workers' breathing zone above worker safety limits?	1. Continue contaminated soil removal and re-evaluate engineering controls, work practices, and/or PPE 2. Stop work 3. Take no action	Are LA fibers collecting in the workers' breathing zone above worker safety limits? If yes, engineering controls, work practices, and/or PPE will be re-evaluated and/or work will stop. If no, cleanup activities will continue with no additional evaluation.
RA Monitoring	Perimeter Air Monitoring	Are LA fibers detected in air along the perimeter of the exclusion zone boundary of an exterior cleanup site?	1. Continue contaminated soil removal and re-evaluate engineering controls and work practices 2. Take no action	Are LA fibers migrating to the exclusion zone boundary during LA contaminated soil removal? If yes, engineering controls and/or work practices, will be re-evaluated and/or work will stop. If no, excavation activities will continue with no additional evaluation.
RA Confirmation	Soil Confirmation	Is LA detected in the soil surface of the excavated area, after soil removal? If so, has the maximum excavation depth of 12 been achieved?	1. Excavate additional soils 2. Stop excavation and designate as either a non-contaminated area or an area of no further removal action	If LA is detected, and – Max. excavation depth is not achieved: 1. Excavate additional soils 2. Continue until no LA is detected or max. excavation depth achieved

				3. Stop excavation and designate as a non-ontaminated area (if [LA] is ND) Max. excavation depth is achieved: 1. Continue excavating additional soils IF LA ≥1% 2. Stop excavation and designate as either a non-contaminated area (if [LA] is ND) or an area of no further removal action (if [LA]<1%)
RA Confirmation	Air Confirmation for Interior Dust Removal	Is LA detected in the air within an NPE after the removal of LA-contaminated dust?	1. Re-clean NPE space 2. Take no action	Does the air in the space that was previously contaminated with LA in the indoor dust contain LA above clearance levels? If yes, the area will be re-cleaned. If no, the area will be deemed non-contaminated.

RA Removal Action
BZ Breathing Zone
NPE Negative Pressure Enclosure
PPE Personal Protective Equipment

Step 3: Identify the Inputs to the Decision
Identify the information needed. Determine the basis for determining the Action Levels. Identify sampling and analysis methods that can meet the data requirements.

The information needed for the decision, the action levels, the basis for the action levels, and analytical method summaries are provided in Table 5-2.
Analytical results (that are confirmatory and do not serve to characterize contamination) are needed within hours of sampling so that excavation/cleanup work may continue with relative continuity. As such, confirmation soil samples will not be ground and will be analyzed via PLM NIOSH 9002.

Table 5-2 Inputs to the Decision

Data Quality Objective	Sample Description	Information Needed	Action Level	Basis for Action Level	Analytical Method
RA Monitoring	Personal Breathing Zone Air Monitoring	Reported Result: ASPCM: 1 f/cc ASTEM: 0.005 S/cm3 Min. Volume: 25 L (a) Collect: TWA: 8-hour STEL: 30-minute excursion sample	TWA: 0.1 PCME f/cc STEL: 1.0 f/cc	OSHA Worker Safety Regulations (1926.1101)	PCM: NIOSH 7400 TEM(d): TEM AHERA with site-specific modifications
RA Monitoring	Perimeter Air Monitoring	ASTEM: ~0.005 S/cm3 Min. Volume: 1200 L Collect: 4 samples, min. along north, south, east & west boundaries of EZ	Each air sample <ASTEM Approx. <0.005 S/cm3	Removal Action Clearance Criteria (b)	TEM AHERA with site-specific modifications
RA Confirmation	Soil Confirmation	Reported Result: % LA by VAE AS: Method defined as 1%, but qualitative estimates of LA present below 1% reported as <1% or ND Approx. Mass: 1 kilogram	Up to max. cleanup depth of 12 inches: ND Below max. cleanup depth: <1% LA by VAE (a) (b)	Removal Action Clearance Criteria (b), (c)	Analysis: NIOSH 9002
RA Confirmation	Air Confirmation for Indoor Dust Removal	ASTEM:~0.005 S/cm3 Min. Volume: 1200 L Collect: 5 samples of disturbed air within NPE	Each of 5 samples of disturbed air <ASTEM Approx. <0.005 S/cm3	Removal Action Clearance Criteria (b)	TEM AHERA with site-specific modifications

AS Analytic Sensitivity al
L Liters
RA Response Action
ND Non-detect

VAE visual area estimation
f/cc fiber per cubic centimeter
S/cm3 Libby Amphibole structures per cubic centimeter of air
TEM AHERA All samples are analyzed by transmission electron microscopy using the counting method as described in the Asbestos Hazard Emergency Response Act (AHERA) (EPA 1987) with site-specific modifications
NPE negative pressure enclosure
a Minimum volume requirements according to the method are 25 L. However, in order to achieve a reasonable analytical sensitivity by TEM, the sampler should attempt to collect 400 L of air for the BZ sample.
b Action Level/Clearance Criteria Technical Memorandum (EPA 2003a).
c As stated in the technical memorandum (EPA 2003b) efforts will be made to avoid having to repeat cleanup activities at a property by cleaning soils at the residential or commercial property to ND up to the maximum cleanup depth of 12 or 18 inches (yard soil/driveway or specific use areas, respectively). Excavation beyond the maximum cleanup depth will only continue if soils have concentrations 1% LA.
d If PCM results are above the OSHA PEL, TEM AHERA confirmation must be performed.
e Approximately 0.5 kg for analysis and 0.5 kilogram for archival

Step 4: Define the Study Boundaries

Define the target population, spatial and temporal boundaries, potential constraints, and the smallest subpopulation.

The target population, spatial and temporal boundaries, potential constraints, and the smallest subpopulation are summarized in Table 5-3.

Table 5-3 Study Boundaries

RA Monitoring	Personal Breathing Zone Air Monitoring	Ambient air within the workers' breathing zone; during removal activities	Each individual worker's breathing zone for the task performed	Collected during exterior or interior removal activities (i.e., removal, interior cleaning)	NA	1 air sample for each Level C task (e.g., laborer, bulk removal, operator, etc.) per week.
RA Monitoring	Perimeter Air Monitoring	Ambient air at the boundary of the EZ; during removal activities	Vertical: Air space above the exclusion zone to sampling height (~4-6 feet) Horizontal: perimeter bounding the site-specific EZ	Collected during exterior removal activities (i.e., excavation)	Inaccessibility due to property boundaries or other obstacles Inclement weather such as rain that can cause the sample to be void ©	4 air samples that bound the EZ
RA Confirmation	Soil Confirmation	Surface soil at the bottom of the excavation site; after soil removal activities	Vertical (a): Yard Soils: 12 inches bgs to ground surface Horizontal: site-specific EZ	Collected after all contaminated soil is excavated and removed from the site and will continue until the area is designated as either non-contaminated or removal actions are discontinued (no further action)	No soil available for sampling because excavation continued to bedrock	1 composite soil sample for every 625 ft2 excavated
RA Confirmation	Air Confirmation for Indoor Dust Removal	Ambient air within the functional space that was previously contaminated with LA; after removal activities	Vertical: Floor surface to the ceiling of the functional space that contained LA contamination Horizontal:	Collected after all LA is removed from the functional space that contained LA and the area is designated non-contaminate	NA	5 air samples (cartridges) per EZ/functional space

			air space contained within the area/NPE where LA dust was removed	d		

EZ Exclusion Zone
RA Removal Action
bgs below ground surface
NA not applicable
a These are generally the vertical boundaries for soil. If LA contamination 1% is found, the vertical boundary shall be extended for that location until the concentration is below 1% LA, to a maximum depth of 3 feet. If gross contamination is encountered at this depth, excavation will continue until the gross contamination is removed.
b A general schedule/timeline for cleanups is provided in the RAWP. This section is specific to timeframes for sampling at a particular property and/or exclusion zone.
c If it is raining, attempts will be made to protect the sample from moisture.

Step 5: Develop a Decision Rule
Population Parameter, Action Levels, Decision Rule:

The population parameter, action levels, and decision rules are summarized in Table 5-4.

Table 5-4 Decision Rule

Data Quality Objective	Sample Description	Population Parameter	Action Level	Decision Rule
RA Monitoring	Personal Breathing Zone Air Monitoring	1 air sample representing the breathing zone for the activity conducted	TWA: 0.1 PCME f/cc STEL: 1.0 f/cc	If the concentrations of the BZ samples 0.1 f/cc engineering controls, work practices, and/or PPE will be re-evaluated and/or work will stop. If no, cleanup activities will continue with no additional evaluation.
RA Monitoring	Perimeter Air Monitoring	4 air monitoring samples that bound the perimeter of the EZ	Each air sample <ASTEM Approx. <0.005 S/cm3	If the concentration of any of the 4 samples 0.005 S/cm3, then excavation engineering controls and work practices will be re-evaluated and/or work will be stopped. If all 4 perimeter air samples are ND, then no action will be taken.
RA Confirmation	Soil Confirmation	Composite Soil Sample representing the area of excavation, per 625 ft2	Up to max. cleanup depth of 12 inches: ND Below max. cleanup depth: <1% LA by VAE (a), (b)	If LA is detected, and – Max. excavation depth is <u>not achieved</u>: 1) Excavate additional soils at approx. 6 inch intervals 2) Continue until no LA is detected or max. excavation depth achieved 3) Stop excavation and designate as a non-contaminated area (if [LA] is ND) Max. excavation depth is achieved: 1) Continue

				excavating additional soils at the discretion of the PM IF [LA] 1% 2) Stop excavation and designate as either a non-contaminated area (if [LA] is ND) or an area of no further removal action (if [LA]<1%)
RA Confirmation	Air Confirmation for Indoor Dust Removal	Sum of all fibers observed on 5 interior cleaning confirmation samples per NPE	Each of 5 samples of disturbed air less than ASTEM ~ <0.005 S/cm3	If the concentration of any of the 5 samples of disturbed air is 0.005 S/cm3, then the functional space will be re-cleaned and subsequently re-sampled. If the concentration of any of the 5 samples of disturbed air <0.005 S/cm3, the functional space will be designated non-contaminated.

EZ Exclusion Zone
RA Removal Action
PCME PCM Equivalent
TWA Time Weighted Average
a Action Level/Clearance Criteria Technical Memorandum (EPA 2003a).
b Excavation beyond the maximum cleanup depth will only continue if soils have concentrations 1%
LA

Step 6: Specify Tolerable Limits on Decision Errors

Null Hypotheses, consequence of making an incorrect decision, gray region, tolerable limits:

For the purposes of completing all six steps of the DQO process, the null hypotheses and consequences of making an incorrect decision are summarized in Table 5-5. However, the gray region and tolerable limits on decision errors are not proposed because they are not applicable in this case.

Typically, Step 6 of the DQO process is useful to encourage careful design of decision rules by defining and integrating the errors that are acceptable based upon myriad integrated project management decisions such as reduction in risk to human health, implementability/practicability, and cost. As stated in the guidance document for development of DQOs: QA/G-4 (EPA 2000), solely statistically generated tolerable limits on decisions errors are not necessary in certain cases providing a line of reasoning (scientific justification) is presented that adequately defines acceptable limits or decision errors. This particular effort was put forth in the Action Level/Clearance Criteria Technical Memorandum for the following DQOs: (1) Soil Confirmation Samples, (2) Perimeter Monitoring Air Samples, and (3) Air Confirmation for Indoor Dust Removal. The decision rule for the personal (BZ) air monitoring samples has been promulgated by legislation, and as such, limits on decision errors do not apply.

Table 5-5 Limits on Decision Errors

Data Quality Objective	Sample Description	Null Hypothesis	Type 1 Error Will Result In:	Type 2 Error Will Result In:
RA Monitoring	Personal (BZ) Air Monitoring	The BZ air is contaminated with LA above the worker safety action levels.	Determining that the BZ air is not contaminated with LA above the worker safety action levels when it actually is. This in turn, results in an increased risk to workers performing removal actions.	Determining that the BZ air is contaminated with LA above the worker safety action levels when it is not. This in turn, results in re-evaluating engineering controls, possibly stopping work, or increasing the level of PPE when it is not necessary and adds unnecessarily to clean up costs.
RA Monitoring	Perimeter air monitoring	The perimeter air is contaminated with LA	Determining that the air is not contaminated with LA when it actually is. This in turn, results in an increased risk to human health.	Determining that the perimeter air is contaminated with LA when it is not. This in turn results in re-evaluating engineering controls and possibly stopping work when it is not necessary and adds unnecessarily to clean up costs.
RA Confirmation	Soil confirmation	The soils below an excavation are still contaminated with LA after removal.	Determining that the surface soils at the bottom of the excavated area are not contaminated with LA when they actually are. This in turn results in an increased risk to human health.	Determining that the surface soils at the bottom of the excavated areas are contaminated with LA when they are not. This in turn results in excavation of additional soils when it is not necessary and adds unnecessarily to clean up costs.
RA Confirmation	Air confirmation for indoor dust removal.	The functional space that was previously contaminated with LA is still contaminated with LA after removal.	Determining that the NPE that previously contained LA-laden dust is not contaminated with LA after removal when it actually is.	Determining that the NPE that previously contained LA-laden dust is contaminated with LA after removal when it is not.

			This in turn results in an increased risk to human health.	This in turn results in unnecessary re-cleaning of the *NPE* and adds unnecessarily to clean up costs.

Step 7: Optimize the Design for Obtaining Data

Using data previously generated for the site, the DQOs have been designed to support the proposed removal activities for the RAWP and represents the best possible project planning effort. However, in implementing the RAWP/RASAP, unforeseen situations may arise or team members may find more efficient means to carry out some of the day-to-day activities. Therefore, team members are always afforded the opportunity to recommend optimization of the data gathering design. Recommendations must come through proper channels as described in Section 5.1 and documented using either a modification form or an addendum to the RAWP. All modifications or addenda must be approved prior to making the proposed
changes.

5.4.2 Data Measurement Objectives
Every reasonable attempt will be made to obtain a complete set of usable field measurements and analytical data. If a result cannot be obtained or is rejected for any reason, the effect of the missing data will be evaluated and transmitted to EPA. In addition, the Surface Soil Sampling SOP provides guidance to ensure that the samples obtained are representative of the media at the Site.

5.4.2.1 Quality Assurance Guidance
The field QA program has been designed in accordance with EPA's Guidance for the DQO Process (EPA 2000), and the EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA 2001).

5.4.2.2 Field Measurements
No field measurements are conducted during this inspection, therefore, no calibrations or maintenance are required.

5.4.2.3 Laboratory Analysis
Samples collected under this Appendix will be analyzed for parameters listed below using methods in parentheses. The analytical methods are as follows:
Soil clearance samples - PLM (NIOSH 9002 Issue 2)
Personal air samples - PCM (NIOSH 7400 Issue 2)
Stationary air samples - TEM AHERA (40CFR Part 763 Subpart E)
Air clearance samples - TEM AHERA (40CFR Part 763 Subpart E)
Samples will be submitted to contract laboratories. Prior to shipping samples, sampling personnel will ensure that the laboratories are ready to receive and analyze samples, can provide necessary data packages, and can provide an electronic copy of the data. The laboratories will submit analytical data reports to HSM or QAM. The data reports will contain a case narrative that briefly describes the number of samples, the analyses, and any noteworthy analytical difficulties or QA/QC issues associated with the submitted samples. The data report will also include signed COC forms, cooler receipt forms, analytical data, and a QC package. The laboratories will provide an electronic copy of the data to the HSM or QAM.

Analytical Sensitivity and Reporting Limits This section is a bunch of hooey and hocus pocus. Let's discuss.
The reporting limits provided in Table 5-2 are the minimum levels that the laboratories will report without a qualifier. If the result is between the instrument detection limit (IDL) and the reporting limit, the value will be reported as Detectable, not quantifyable by the laboratories. The achievement of reporting limits depends on sample matrix effects and the IDL. The IDL depends on instrument sensitivity. It is therefore important for the laboratories to monitor the sensitivity of data-gathering instruments to ensure data quality through constant instrument performance checks. Because the reporting limits may vary based on the IDL, the values provided in Table 5-2 are estimates and may change based on laboratory-specific circumstances.

Laboratory Quality Assurance Program

The laboratories must be NVLAP (National Voluntary Laboratory Accreditation Program) certified and must follow the NVLAP QA program requirements. In addition, the laboratories performing analyses must follow all project-specific analytical and QA/QC modifications and must continue to participate in the project-specific analysis of performance evaluation samples, inter-laboratory samples, same and different analyst recounts, verified analyses, and laboratory duplicates at the project-specified frequencies.

5.5 Special Training Requirements

Special training required for this project includes the following:

- Health and safety training, as described in the CSHASP

5.6 Documentation and Records

The HSM has the responsibility for maintenance of records, including copies of all FSDSs, original field logbooks, work plans and RASAPs, and any correspondence pertinent to conducting removal activities at the site. Original FSDSs are maintained in the on-site office in the event that sample information needs to be updated or corrected. Revisions to FSDSs will be made using a single strikeout, initial, and date. .Because field logbooks are not to be revised, original logbooks are shipped offsite to a secure file repository and copies maintained for reference on-site. These are shipped by the QA representative. Property surveys, if required, are maintained in the secure file repository. Project personnel are responsible for project documents in their possession while working on a particular task. Field logbook(s) are issued on an as-needed basis. A logbook is maintained in the on-site office and provided by the HSM. Documentation describing changes to approved field plans or sample preparation or analytical methods, if they occur, will be included in the project files in the form of an approved Request for Modification form. Blank field and laboratory Request for Modification forms are provided in Appendix A-3. Request for Modification forms will be initiated by the HSM or laboratory personnel and reviewed/approved by the OSC and PM. Original forms with OSC and PM signatures will
be maintained in the on-site office (for field plan changes) and at PacifiCorp (for laboratory procedure changes), with copies distributed to the file repositories. The laboratories will submit hard copy sample data packages to the HSM, and electronic data deliverables (EDDs) to the PM and the HSM.

Section 6
Measurement and Data Acquisition

This section covers sample process design, sampling methods requirements, handling and custody, analytical methods, QC, equipment maintenance, supply acceptance, and data management. The field procedures are designed so that the following occurs:

- Samples collected are consistent with project objectives
- Samples are collected in a manner so that data represent actual site conditions

6.1 Sample Process Design

The overall goal of the sampling is to monitor: (1) worker exposure and contaminant containment during removal activities; and (2) the effectiveness of the cleanup (i.e., confirmation) following removal activities. This will be accomplished by collecting personal air (BZ) samples and stationary monitoring samples during removal activities and by collecting the following samples after removal: soil confirmation and air confirmation samples for indoor dust removal. The sample process design is discussed in Section 3 of this RASAP.

6.2 Sampling Methods Requirements

Sampling methods, sample containers, and overall field management are described below.

6.2.1 Sampling Equipment and Preparation

Equipment required for field sampling, health and safety, documentation, and decontamination is presented in Sections 4.2 of the FSP. Field preparatory activities include review of this RASAP and SOPs, procurement of field equipment, laboratory coordination, and a daily field planning meeting that includes field personnel, the HSM, and the QAM. Mobilization is described in Section 4 of the FSP.

6.2.2 Sample Containers

All confirmation soil samples and air samples will be collected and placed into plastic zip-lock baggies.

6.2.3 Sample Collection, Handling, and Shipment

Samples collected during the project consist of air and soil, and QC samples. All sample collection procedures are outlined in Section 4 of the FSP, and in other SOPs as provided in Appendix A-1 to this document. The SOPs applicable to this inspection are provided in Appendix A-1. QC samples will also be collected, handled, and shipped in accordance with these procedures.

6.3 Sample Handling and Custody Requirements

Custody and documentation for field and laboratory work are described below, including a discussion of corrections to documentation.

6.3.1 Field Sample Custody and Documentation

Sample custody and documentation will follow the requirements specified in SOP 1-2, Sample Custody, and site-specific SOPs for completion of FSDS and electronic COC forms (Appendix A-1). All samples and sampling paperwork will be relinquished to the HSM at the end of each day. The HSM will be responsible for managing all field forms. The distribution of field paperwork is discussed in Section 5.6. Upon completion of the FSDS by the sampler and a possible quality control spot check by an independent field team member, the HSM will use the FSDS to generate a COC. Three copies of the COC will then be printed using three-part carbonless paper. One copy will be filed in the on-site office and the other two will accompany sample shipments. The HSM will check the COC against the samples in the shipping container to ensure consistency and will hand deliver
or ship samples as appropriate. If any errors are found on the COC after delivery/shipment, the paper copy of the COC maintained in the on-site office will be corrected by the HSM with a single strikeout, initial, and date. The corrected copy will then be faxed to the analytical.

6.3.1.1 Sample Labeling and Identification

A unique alphanumeric code, or Index Identification (ID), will identify each sample collected during sampling events. The coding system will provide a tracking record to allow retrieval of information about a particular sample and to ensure that each sample is uniquely identified. Index IDs will be sequential and not be representative of any particular building or equipment. Index IDs will correlate with sample locations IDs, which will be identified on field sample data sheets (FSDSs) and in the field logbooks. The sample labeling scheme is as follows:

2R-XXXXX

Where:

2R identifies that a sample is collected in accordance with this RASAP
XXXXX represents a 5-digit numeric code

Pre-printed adhesive Index ID labels will be prepared by the HSM or his designee using an Index ID logbook. The labels are controlled to prevent duplication in assigning sample IDs. Index ID labels will be used in accordance with SOP 1-2, Sample Custody (Appendix A-1) for contract laboratory samples. The

labels will be affixed to both the sample cassette and sample bag for air samples, and both the inner and outer sample bags for soil samples.

6.3.1.2 Chain-of-Custody Requirements

Chain-of-custody procedures and sample shipment will follow the requirements stated in the site-specific SOP for eCOCs and SOP 1-2, Sample Custody, and SOP 2-1, Packaging and Shipping of Environmental Samples with modification (Appendix A-1). The COC record is employed as physical evidence of sample custody and control. This record system provides the means to identify, track, and monitor each individual sample from the point of collection through final data reporting. A completed COC record is required to accompany each shipment of samples. All samples will be handles under the supervision of the HSM under strict custody. The HSM will follow custody procedures to ensure proper sample custody between acceptance of samples from the samplers and shipment to the laboratory.

6.3.1.3 Sample Packaging and Shipping

Samples will be packaged and shipped in accordance with SOP 2-1, Packaging and Shipping of Environmental Samples (Appendix A-1) for samples sent to a contract laboratory. Custody seals will be placed on each sample and on at least two sides of the shipping container, if applicable. All samples will be picked up by a courier, delivered to the laboratories, or shipped by a delivery service to the designated laboratories, as necessary.

The following modifications to SOP 2-1 have been reviewed and approved for samples being analyzed for asbestos:

6.3.1.4 Field Logbook and Records

Field logbooks will be maintained in accordance with SOP 4-1, Logbook Content and Control (Appendix A-1). The log is an accounting of activities at the site and will duly note problems or deviations from the governing plans and observations relating to the sampling and analysis program. The field team leader will maintain the logbook(s) and will place copies of the field logbook in the project files on a weekly.

6.3.3 Corrections to and Deviations from Documentation

Documentation modification requirements for field logbook entries are described in SOP 4-1, Field Logbook Content and Control (Appendix A-1). For the logbooks, FSFS, and COCs, a single strikeout, initialed and dated, is required for documentation changes. The correct information should be entered in close proximity to the erroneous entry. All deviations from the guiding documents will be recorded in the field logbook. Any major deviations will be documented via an approved Request for Modification form. Blank Request for Modification forms documenting changes to field plans and laboratory procedures, respectively, are provided in Appendix A-3. The EPA OSC will be notified of any major changes or deviations.

6.4 Analytical Methods Requirements

The laboratory QA program and analytical methods are addressed below.

6.4.1 Laboratory Quality Assurance Program

Samples collected during this project will be analyzed in accordance with standard EPA and/or nationally recognized analytical procedures. The analytical laboratories must be NVLAP (National Voluntary Laboratory Accreditation Program) certified and must follow the NVLAP QA program requirements. In addition, the laboratories performing analyses must follow all project-specific analytical and QA/QC modifications and must continue to participate in the project-specific analysis of performance evaluation samples, inter-laboratory samples, same and different analyst recounts, verified analyses, and laboratory duplicates at the project-specified frequencies.

6.4.2 Methods

The methods to be used for analysis are described in Section 5.4.2.4. The following asbestos analytical methods are to be used:

- PCM (NIOSH 7400 Issue 2), for personal breathing zone air sample analysis
- TEM AHERA (40CFR Part 763 Subpart E) with modification, for stationary and final clearance air sample analysis, and positive identification of asbestos fibers as a supplement to NIOSH 7400
- PLM (NIOSH 9002 Issue 2), for soil confirmation samples

6.5 Quality Control Requirements

Field and internal office QC are discussed below.

6.5.1 Field Quality Control Samples

Field QC samples will consist of lot and field blanks for air sampling. The frequency of collection and analysis requested for lot and field blanks are discussed in detail in Section 3.2, Quality Assurance and Quality Control Samples. No other field quality control samples are required to be collected under this RASAP.

6.5.2 Internal Quality Control Checks

Internal QC checks will be conducted throughout the project to evaluate the performance of the project team during data generation. All internal QC will be conducted in accordance with the applicable procedures listed below:

- All project deliverables will receive technical and QA reviews prior to being issued to EPA in any form.
- Completed review forms will be maintained in the project files.
- Corrective action of any deficiencies is the responsibility of the PM, with assistance from the QAM, if necessary.

6.5.3 Quality Control Checks

Internal QC checks will be conducted throughout the project to evaluate the performance of the project team during data generation. All internal QC checks will be conducted in accordance with the applicable procedures listed below:

- All project deliverables will receive technical and QA reviews prior to being issued to EPA in any form
- Completed QC Control review forms, which document technical and QA reviews of project deliverables, will be maintained in the project files.

- Field and office audits will each be performed, if requested by the PM.
- Field and office assessments may be performed as spot checks, at a frequency determined by the QAM.
- Corrective action of any deficiencies is the responsibility of the PM, with assistance from the QA staff, if necessary.

In addition to internal QC checks, PacifiCorp or EPA may, at any time, perform independent audits or assessments of work practices, including field, office, or laboratory checks.

6.6 Equipment Maintenance Procedures

All field and laboratory equipment will be maintained in accordance with the manufacturers' maintenance and operating procedures. All maintenance activities will be documented in a logbook. For the field activities, a description of maintenance performed will appear in the field logbook on the date/time that it occurred. See Section 6.7.2 for details on record keeping for maintenance at the analytical laboratories.

6.7 Instrument Calibration Procedures and Frequency
Calibration of field and laboratory instruments is addressed in the following subsections.

6.7.1 Field Instruments
The only field measurements collected during this project are volume estimations. Since these do not require field instruments, no calibration or maintenance is required.

6.7.2 Laboratory Instruments
Calibration of laboratory instruments will be based on written procedures approved by laboratory management and included in the laboratory's QA manual. Instruments and equipment will be initially calibrated and continuously calibrated at required intervals as specified by either the manufacturer or more updated requirements (e.g., methodology requirements). Calibration standards used as reference standards will be traceable to EPA, National Institute of Standards and Technology, or another nationally recognized reference standard source. Records of initial calibration, continuing calibration, repair, and/or replacement of laboratory equipment will be filed and maintained by the laboratories. Calibration records will be filed and maintained at the laboratories' location where the work is performed and may be required to be included in data reporting packages.

6.8 Acceptance Requirements for Supplies
Prior to acceptance, all supplies and consumables will be inspected by the HSM or designee to ensure that they are in satisfactory condition and free of defects.

6.9 Non-direct Measurement Data Acquisition Requirements
Non-direct measurement data include information from previous sampling events. The acceptance criteria for such data include a review by someone other than the author. Any measurement data included in information from the above sources (i.e., previous sampling event) will determine further action at the Site only to the extent that those data can be verified by project staff.

6.10 Data Management
The laboratories will submit hard copy sample data packages to the HSM, and electronic data deliverables (EDDs) to PacifiCorp.

Section 7
Assessment and Oversight

Assessments and oversight reports to management are necessary to ensure that procedures are followed as required and that deviations from procedures are documented. These reports also serve to keep management current on field activities.
Assessment and oversight reports are discussed below.

7.1 Assessments and Response Actions
Assessments and corresponding response actions are discussed below.

7.1.1 Assessments
Performance assessments are quantitative checks on the quality of a measurement system and are appropriate to analytical work. Performance assessments for the laboratories may be accomplished by submitting reference material as blind reference (or performance evaluation) samples. These assessment samples are samples with known concentrations that are submitted to the laboratories without informing the

laboratories of the known concentration. Samples will be provided to the laboratories for performance assessment upon request from the EPA OSC or PacifiCorp PM. Laboratory audits may also be conducted upon request from the EPA OSC or PacifiCorp PM.
System assessments are qualitative reviews of different aspects of project work to check on the use of appropriate QC measures and the functioning of the QA system. Any determination or changes for project assessments will be performed under the direction of the QA manager, who reports directly to the PM.

7.1.2 Response Actions

Response actions will be implemented on a case-by-case basis to correct quality problems. Minor response actions taken in the field to immediately correct a quality problem will be documented in the applicable field logbook and a verbal report will be provided to the HSM. For verbal reports, the HSM will complete a communication log to document that response actions were relayed to him. Major response actions taken in the field will be approved by the HSM and the EPA OSC and PacifiCorp PM prior to implementation of the change. Major response actions are those that may affect the quality or objective of the project. All formal response actions will be submitted to either the HSM or the QAM for review and issuance.

7.2 Reports to Management

QA reports will be provided to the HSM and PM whenever quality problems are encountered. Quality problems will be notedvon field data sheets. The HSM will inform the project QAM upon encountering quality issues that cannot be immediately corrected. Weekly reports and change request forms are not required for this work assignment. Monthly QA reports will be submitted to the PM by the project QAM.

Topics to be summarized regularly may include but not be limited to:

- Document technical and QA reviews that have been conducted
- Activities and general program status
- Project meetings
- Corrective action activities
- Any unresolved problem
- Any significant QA/QC problems not included above

Section 8
Data Validation and Usability

Laboratory results will be reviewed for compliance with project objectives. Data validation and evaluation are discussed in Sections 8.1 and 8.2, respectively.

8.1 Data Review, Validation, and Verification

Requirements Better check these guidelines to ensure this is something R&R should be doing.
The HSM or QAM may validate data submitted by analytical laboratories. Data validation will be performed according to the EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 2002), with method specific requirements superseding the NFG guidelines. If validation is requested, an SOP for the method-specific validation process will be prepared. In general, data validation consists of examining the sample data package(s) against pre-determined standardized requirements. The validator may examine, as appropriate, the reported results, QC summaries, case narratives, COC information, raw data, LCS/LCSDs,

MS/MSDs, initial and continuing instrument calibration, and other reported information to determine the accuracy and completeness of the data package. During this process, the validator may verify that the analytical methodologies were followed and QC requirements were met. The validator may recalculate selected analytical results to verify the accuracy of the reported information. Analytical results will then be qualified as necessary.
Data verification includes checking that results have been transferred correctly from laboratory data printouts to the laboratory report and to the EDD.

8.2 Reconciliation with Data Quality Objectives

Once data has been generated, the HSM evaluates data to determine if DQOs were achieved. This achievement will be discussed in the measurement report, including the data and any deviations to this RASAP. Additionally, a section in the measurement report will present the data quality assessment (DQA) evaluation. The DQA will synthesize the data reviews described in Section 8.1 and provide information about any overall biases introduced into the data due to either field or analytical activities. All QC sample results will be maintained in the same database along with the investigative sample results.

Section 9
References

RAC Region VIII Quality Management Plan. January,2003b.

Modification to Laboratory Activities. June. 2002a.

Final Sampling and Analysis Plan for the Remedial Inspection of Contaminant Screening Study. April. 2002b.

Technical Standard Operating Procedures Manual. Revision 16. December. 2002c.

Quality Assurance Manual, Revision 10. February. 2002d.

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Final. July2001.

EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Final2000.

Guidance for the Data Quality Objectives Process, EPA QA/G-4, Final. September1994.

Test Methods for Evaluating Solid Waste, Laboratory Manual. 3rd Edition. September with revisions

Appendix A-1: SOPs

Sample Custody (SOP 1-2)

Part I: Bulk samples:

Equipment needed:

- Sample Containers (Plastic Bottles, etc.)
- Garden Spade
- Zip-lock-type plastic bags
- Marking Pen
- Ball-Point-type pen
- FSDS, COC forms
- Field Notebook
- Clipboard

Procedure:

- Determine sample location(s) IAW Health and Safety Plan, daily needs
- Use cleaned tools to obtain the sample
- Place sample in a plastic sample container
- Immediately after each bulk sample is obtained, label sample container with a unique number
- Put sample container in a plastic storage/transmittal bag
- Complete Field Sample Data Sheet (FSDS), fill in appropriately as each sample is obtained
- Fill out Chain of Custody (COC) Form, if separate from FSDS
- Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples

Part II: Air Samples:

Site Sampling:

Equipment needed:

- TEM cassettes (MCE)
- Medium/High Flow AC Pumps (capable of drawing approximately 16 liters/minute)
- Tygon-type tubing
- Duct tape
- Zip-lock-type plastic bags
- Marking Pen
- Ball-Point-type pen
- FSDS, COC forms
- Field Notebook
- Clipboard
- Extension cord(s)

Procedure:

Determine sample location(s) IAW Health and Safety Plan, daily needs
Position pump(s), ensure electricity is available (run extension cord, as necessary)
Turn pump on; allow pump to warm up for at least five minutes before beginning sample
Assign unique number to sample, write on label affixed to TEM cassette
Record location, TEM cassette number on FSDS
Attach Tygon-type tubing on pump
Affix end of tubing securely at approximately "breathing zone" height (approx. 60 inches)
Remove plugs from TEM cassette
Attach TEM cassette to tubing (with cap attached)
Perform calibration with precision rotometer; record flow on FSDS
Remove cassette cap (sample open faced)
Note time, record on FSDS and cassette label
If sample duration exceeds 4 hours, check sample at mid-point*
After appropriate sampling interval, perform calibration, record on FSDS
Record time on FSDS and remove cassette
Replace plugs on cassette
Seal cassette and place cassette in plastic bag
Determine and record average flow on FSDS and sample label
Turn off pump or add new cassette, as needed
Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples

Personal Sampling:

Equipment needed:

PCM cassettes (MCE)
Low-Flow Battery-Operated Pumps (with charger)
Tygon-type tubing
Duct tape
Zip-lock-type plastic bags
Marking Pen
Ball-Point-type pen
FSDS, COC forms
Field Notebook
Clipboard

Procedure:

Turn pump on
Attach Tygon-type tubing
Assign unique number to sample, record on label affixed to PCM cassette
Record PCM cassette number on FSDS
Remove plugs from PCM cassette
Attach PCM cassette to tubing (with cap attached)
Attach PCM cassette to tubing
Calibrate sample train with precision rotometer
Remove cassette cap (sample open faced)
Record sample number, location, flow on FSDS and on sample label
If sample duration exceeds 4 hours, check sample at mid-point*
After appropriate sampling interval, calibrate sample train
Remove cassette, replace plugs
Record appropriate data on cassette label
Seal cassette and place in plastic storage/transfer bag

Fill out FSDS
Turn off pump or add new cassette, as needed
Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples

All samples will be kept in a locked area or the sampler's immediate possession at all times until delivered to lab
If samples are transferred to another authorized person for transmittal, the transporter must sign for the samples on Chain Of Custody Form (may be part of FSDS)
The lab will sign for the samples upon receipt
* If sample membrane shows darkening, change out cassette with new

Surface Soil Sampling (SOP 1-3)

Composite samples shall be taken each 625 square feet of area to determine if LA content is below clearance criteria:

Excavation will continue until the excavated area is free of all visible LA

Collect five soil samples (each approximately two cubic inches) randomly from the exposed substrate

Composite the five samples into one sample container

Each composite sample will be split (one portion held in archive, one submitted to the lab and one given to EPA at their request)

Submit one "split" composite sample to lab

Each submitted composite sample will be homogenized at the lab

Sample collection equipment used on-site will be washed between each composite sampling episode

Packaging and Shipping of Environmental Samples (SOP 2-1)

Environmental Samples will be:

Packaged in plastic containers, which will be placed in plastic Zip-Lock-type bags

Cushioned to prevent potential damage during shipment

Subjected to Chain-Of-Custody requirements until shipped and at each transfer

Transported to the appropriate lab or drop-off point (FedEx, etc.) as soon as practicableVermiculite (or other absorbent material), bubble wrap, or ice will not be used for packaging or shipping samples.

No vermiculite or other absorbent material will be used to pack the samples. No ice will be used.

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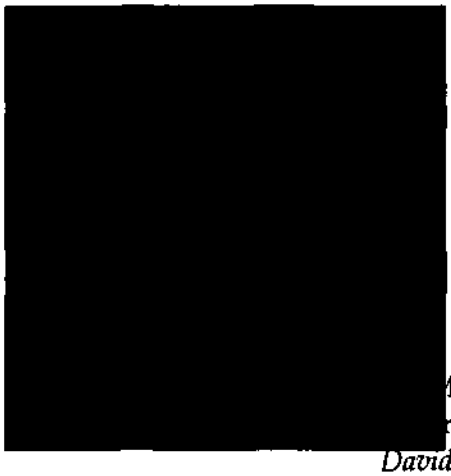
Comprehensive Site Health and Safety Program

3rd West Substation Remediation Project



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Section 1
Introduction

This Comprehensive Site Health and Safety Program (CSHASP) was prepared by R & R Environmental, Inc. (R & R) for the PacifiCorp 3rd West Substation Remediation Project, Salt Lake City, Utah. This plan is based on all available site-specific data. In addition to other regulatory requirements, all work will be performed in compliance with applicable parts of regulations set forth by the U. S. Occupational Safety and Health Administration's (OSHA) Title 29 of the Code of Federal Regulations (CFR), Parts 1910 and 1926, and EPA's Hazardous Waste Requirements (40 CFR 260-270), Comprehensive Environmental Response Compensation and Liability Act (CER[redacted]lan (NCP). The contents of this CSHASP are subject to revie[redacted]n becomes available.

1.1 [redacted]ehensive Site Health and

The p[redacted]be the chemical and safety hazards that may be present, and t[redacted]these hazards during the collection of various types of envir[redacted]tivities at the 3rd West Substation site. The safety and healt[redacted]ASP are designed to minimize the possibility of injury or asbes[redacted]ng various sampling and removal activities.

This CSHASP is intended as a guideline that allows the Health and Safety Manager (HSM) to respond to changing conditions regarding the interpretation of monitoring data and related control measures.

1.2 Responsibilities of the Comprehensive Health and Safety Program

The requirements established by this CSHASP are mandatory, and apply to all PacifiCorp personnel and PacifiCorp subcontractors involved in implementing the described scope of work, and any other personnel entering regulated work areas during active field operations. PacifiCorp is responsible for training all of its employees and subcontractors regarding the information and contents of the CSHASP prior to the commencement of work. A copy of this plan is available to any authorized personnel who must enter regulated work areas. PacifiCorp will maintain a copy of the CSHASP, available for inspection, at the work site during each day of field operations.

The HSM will be responsible for implementing this plan and will report directly to the Project Manager on all project related health and safety matters. In the event that an emergency situation arises, the HSM will coordinate with the PacifiCorp Project Manager, the EPA On-Scene Coordinator (OSC), and contractor Field Team Leaders, as needed. The HSM has the authority to intercede directly and stop any unsafe practices.

1.3 Revision of the Comprehensive Health and Safety Program

Changes in the scope of work operations, and/or changing or unanticipated site conditions may require modification and approval of the CSHASP in order to maintain field safety in compliance with contract requirements and OSHA regulations. Work operations affected by the revisions will not proceed unless specifically authorized by the EPA On-Scene Coordinator (OSC). Only the OSC may authorize operations to continue while changes to the CSHASP are under review by the contracting agency.

1.4 Implementation of the Comprehensive Health and

[redacted]

Befo site, a health and safety planning or "tailgate" meeting will ss safety procedures and to familiarize personnel with the p rsonnel will be informed of any modifications to the CSH y meetings or when site conditions or risks change.

The pections throughout the project to evaluate site opera onduct a daily tailgate safety meeting with all site perso

Section 2
Health and Safety Project Organization

2.1 Organization and Safety Responsibilities

Based on the scope of work, the PacifiCorp field work team will consist of the Project Manager (PM), Health and Safety Manager (HSM), and contractor Field Team Leaders, sampling personnel, and equipment operators. This section presents discussions of the health and safety responsibilities of PacifiCorp personnel and their subcontractors, and authorized site visitors.

Pacif[redacted]ng for individuals tasked with health and safety resp[redacted]esponsibilities of the project team are outlined in the follo[redacted]

2.2 [redacted]

2.2.1 [redacted]

The [redacted]f the Project Manager include, but are not limited to:

- En[redacted]ed by the EPA prior to commencement of operations (te[redacted]olidated comments on technical documents by Federal Or[redacted]ministrative Order on Consent)
- Ensuring that all personnel assigned to the project are instructed on the work plan, operations to be performed, known and potential hazards associated with the work, CSHASP requirements, proper use of required personal protective equipment, specified safe work practice, proper action in the event of medical or chemical emergencies, and related site specific safety information
- Ensuring that required personal protective equipment, air monitoring instruments, and other safety-related items are provided for the project
- Monitoring overall safety performance of field personnel, in coordination with the HSM
- Correcting any work practices and/or conditions that may result in injury and/or exposure to hazards
- Immediately stopping remediation (including subcontractor) operations in the event of an emergency or serious hazard
- Preparing and submitting required work progress/accident history reports and air monitoring reports
- Maintaining all required safety and health records (i.e. OSHA 300 Logs, Accident Reports, Records of Training, Safety Inspection Reports, etc.).

2.2.2 Health and Safety Manager

The health and safety responsibilities of the Health and Safety Manager (HSM) include, but are not limited to:

- Supervising daily on-site implementation and enforcement of the CSHASP
- Conduct daily safety inspections
- Conducting daily tailgate safety meetings
- Being on-site for the duration of field activities for safety- and health-related duties
- Er[redacted]l, state and OSHA safety and health regulations and all re[redacted]ng, but not limited to, activity hazard analyses, air m[redacted]tion, site control, procedures used to minimize hazards, sa[redacted]emergency response plan, spill containment program, an[redacted]y and health inspection results
- Ev[redacted]ecommending changes to engineering controls, work pr[redacted]
- Co[redacted]y on-site safety and/or health training
- St[redacted]n or safety conditions exist, and taking necessary action to re-establish and maintain safe working conditions
- Providing 24-hour availability for consultation during on-site emergencies
- Providing on-site consultation, as needed
- Consulting with and coordinating any modifications to the CSHASP with the EPA OSC
- Serving as a member of the quality control staff on matters relating to safety and health
- Conducting accident investigations and preparing accident reports
- Documenting the safety and health findings during daily quality control inspections
- Recommending corrective actions for identified safety and health deficiencies and overseeing the corrective actions, in coordination with site management
- Performing collateral duties as the Site Quality Control Officer (QCO) on this project with the combined title of Site Health and Safety/Quality Control Officer (SSH/QCO). These duties shall include:
    - Assuring that all personnel on-site are acquainted with appropriate provisions of CSHASP
    - Inspecting safety and health equipment to assure proper operation and accuracy
    - Monitoring the PPE and safety practices

- Providing continued support for upgrading/downgrading of the level of personal protection

2.2.3 Subcontractors

The health and safety responsibilities are defined in Appendix C, Health and Safety Protocol for Subcontractors, and include the following:

- Subcontractors have the same responsibilities as PacifiCorp field personnel.
- Provide Material Safety Data Sheets (MSDSs) for subcontractor-provided materials at the job site

2.2.4 [redacted]

The [redacted] include:

- Re[redacted]ructions from the HSM
- Re[redacted]CSHASP
- Us[redacted]reas, when such controls are required for entry as per the CS[redacted]
- Re[redacted]nd/or condition at, or affecting, the work site

In ad[redacted]ontractor who seeks entry into the work area will present current documentation of current training appropriate to the level of work being performed. Electrical hazard training provided by PacifiCorp is required for all workers. All visitors on the site must have either the electrical hazard training or be escorted by an electrically-qualified PacifiCorp employee. In addition, a visitor log will be maintained in the project trailer. Photographic identification (i.e. Government-issued identification, Company or Agency identification badges) will be mandatory to enter the site, for all site personnel and authorized visitors.

Section 3
Hazard Assessment

Trace amounts of Libby amphibole are known to be present at the site. Hazards include asbestosis, a disease that makes breathing progressively more difficult due to scarring of the lung tissue and can be fatal. Libby amphibole fibers may also be a contributing cause to lung cancer and mesothelioma. Mesothelioma is a rare cancer of the lining of the lungs and chest cavity that is always fatal and can almost always be associated with asbestos exposures.

The p[redacted]me Libby amphibole fibers. All site personnel will be prote[redacted]ure through work practices. These work practices inclu[redacted]ion, covering trucks during hauling, and considering wind[redacted]Personal protective equipment will be used by site perso[redacted]nt will include the use of NIOSH-approved respirators with[redacted]ek or similar disposable clothing. All site personnel work[redacted]te personal decontamination upon each exit.

The p[redacted]nsport of potentially contaminated soil. Additionally, dust [redacted]he substation control house. Safety hazards associated with [redacted]trips, falls, pinch points, collisions - present a more consi[redacted]han Libby amphibole exposure. Overall, the greatest indiv[redacted]lectrical hazards related to unintentional contact with high-voltage electrical conductors.

Section 4
General Health and Safety Program

4.1 Project Management

The most influential factor controlling project safety is effective project management, and the most influential personnel in this regard are the project managers. Listed below in descending order are the five most important tools that project managers have to influence project safety:

- Effective project management
- Jo
- M
- Co
- Sa

Proje ned properly will show good safety performances. The oppo oorly (i.e., jobs behind schedule, under staffed, or poor poor safety performances.

Incorporating safety into initial project planning enables site workers to perform tasks safely with adequate staff, time, and equipment.

4.1.1 Planning

Safety must be incorporated into the project from start to finish to maintain good safety performance. Incorporating safety into initial project planning enables site workers to perform tasks safely with adequate staff, time, and equipment. Up-front planning also allows for comprehensive hazard recognition and control planning by qualified staff. Activities such as confined space entry, emergency response, and site safety meetings must be recognized and coordinated early in the project planning stages.

When planning for safety, project managers should consider the following:

Costs. Costs should be considered for safety equipment such as decontamination trailers, air monitoring instruments, rescue equipment, protective clothing, and respirators.

Staff. Project managers should plan for adequate, qualified staff to perform the job safely. Staffing considerations include rescue personnel, partners for the buddy system, and staff to perform air monitoring and prepare the health and safety plan (HASP).

Time. Time should be allotted for necessary safety activities, including site safety inspections, weekly Toolbox Safety Meetings, and site-specific health and safety plans (SHASPs) and/or Activity Hazard Analyses (AHAs) preparation and review.

4.1.2 Effective Project Coordination

Safety performance improves with improved project coordination. The following areas, when effectively coordinated by project managers, benefit project safety performance:

- Co[redacted]s
- Co
- Co[redacted]cue, and fire departments
- Pu[redacted]site security
- Pr
- Eq

4.1.3 Management Emphasis on Safety

Management emphasis on safety is a key component of site safety management. Project managers should wear appropriate safety equipment, maintain safety as a routine topic of planning and progress meetings, and recognize safe employees and discipline unsafe employees. Effective project managers send a clear and consistent message that safe behavior is expected and anything less will not be tolerated.

4.1.4 Communication

Possessing good "people skills" is often a significant factor in project safety because a good safety performance cannot be achieved without the project team communicating and working together. Project managers need to communicate safety expectations and instructions effectively. Site employees should understand the site safety procedures and be aware that compliance with them is required. They should feel comfortable to ask questions, report injuries, incidents, and safety concerns, and to provide general feedback and recommendations to the project manager.

Toolbox Safety Meetings offer not only the opportunity to provide technical safety instruction, but also provide occasion for feedback and suggestions from site employees. Personnel performing their craft can often suggest effective solutions to hazards, especially those pertinent to their trade. Overlapping hazards require effective communication and teamwork between the involved project staff.

4.1.5 Safe Work Environment

Project Managers and Field Team Leaders maintain a safe work environment by consistently implementing SHASP and adhering to OSHA standards and guidelines. Whether subcontractors have an approved SHASP of their own or follow an existing SHASP, site Project Managers should require that it be consistently implemented. The HSM should be consulted when tasks change and when unanticipated hazards arise to discuss safety issues and amend health and safety procedures accordingly.

The first step in controlling hazards is the recognition of the hazard. Employees share responsibility for observing the work areas and procedures to identify potential or existing haza[redacted]am Leaders perform inspections (audits) to identify and direc[redacted]ns and work practices.

4.1.6 [redacted]ns

Safet[redacted]tify unsafe conditions and work practices on site. Safety audi[redacted]g unsafe conditions and work practices. Safety audits may [redacted] on a weekly basis, or when new substances, processes, proc[redacted]ed that pose a new occupational safety and health hazard and [redacted]s are observed. The Health and Safety Audit Criteria is locat[redacted]ety Audit Form (Form I) is used for documenting audits.

4.1.7 [redacted]itions

Unsafe conditions noted during safety audits are assigned to a responsible person(s) for required follow-up action. The project manager and HSM review safety audits to assure follow-up actions adequately control the hazard(s). Project managers and the HSM will not close a Site Safety Audit Report file until the required follow-up action is complete.

For situations presenting an imminent hazard to employees, the auditor directs work to cease and workers to exit the area immediately until the hazards are controlled. The HSM and project manager have the authority to stop work until hazards are abated.

Hazards shall be controlled as quickly as possible and in a timely manner, based on the severity of the hazard as determined by the project manager or the HSM.

4.2 Standard Site Procedures

Due to the diverse nature of activities performed, there are a number of regulations and standards that must be considered during the performance of activities. In addition, there are standard procedures that are applicable to activities performed at all hazardous, or potentially hazardous, waste sites. This section summarizes some of the key OSHA standards and procedures that may be applicable to various activities.

The following project health and safety program rules are adopted for the protection of all persons involved with activities on all projects. These rules apply to management, owner, and site personnel as well as visitors while on the job site. These rules are general in nature and are not to be considered all-inclusive, nor do they relieve contractors, subcontractors, or their

employees from applicable occupational health and safety regulations promulgated by governmental authorities.

4.2.1 Housekeeping

Leads, hoses, and extension cords shall be hung up with a nonconductive material, off all floors, stairways, and walkways. Trash such as drinking cups, cans, and scraps from lunch are not to be thrown down, but disposed of properly in marked containers.

Available material, equipment, concrete forms, pipe, etc. are to be stacked orderly away from walkways, doors, stairways, and ladders.

Oil, g[redacted] shall be cleaned up at the time of spill and are not to be left u[redacted]

Each [redacted] eping in his or her respective work areas.

Whe[redacted] r anchor bolts create a tripping hazard, they shall be prop[redacted] marked.

4.2.2 [redacted] pment

Eye P[redacted] e worn at all times. Safety goggles shall be worn when possi[redacted] ace shields shall be worn while grinding, chipping concr[redacted] present.

Hard Hats — Hard hats shall be worn at all times in all areas on site, except when inside an enclosed vehicle.

Shoes — Steel-toe safety boots or shoes meeting the requirements of ANSI 241.1 are to worn at all times, except in enclosed vehicles.

Shirts and Pants — Shirts covering the full trunk and shoulders are required. Tanktops or midriff shirts are not allowed. Cut-off jeans or shorts will not be worn on the job site.

Hearing Protection — Hearing protection shall be worn when working in excessively noisy areas.

Respiratory Protection — Respiratory protection shall be worn when required.

Vehicle Safety — Seat belts shall be worn in all vehicles.

Disposable Coveralls — Required at all times in the exclusion zone. Street clothes are not to be worn under disposable coveralls.

4.2.3 Fall Protection

Fall protection is required 100 percent of the time when exposed to a fall in excess of six feet or when required by additional rules. One hundred percent fall protection is required whether climbing, traveling from point A to point B, connecting structural steel, or erecting scaffolds or

other temporary platforms. No employee or work operation is exempt from the 100 percent fall protection requirement.

When not protected by any other means of fall protection, such as safety nets or scaffold with proper guardrails, employees shall use full body harnesses, lanyards with double-locking snap hooks, and an adequate anchorage (fall arrest equipment). To achieve 100 percent fall protection, employees may need to use a double lanyard system and/or vertical or horizontal lifelines, retractable lifelines, or other approved positioning devices.

Employees shall rig fall arrest equipment so that they can neither free-fall more than six feet nor contact any lower object. Anchorage points for fall arrest equipment shall be capable of supp[redacted]nergy of an employee free falling six feet or the distance perm[redacted]ess. Anchorage points for fall arrest equipment shall be locat[redacted]ness attachment point where practical.

Whe[redacted]rate lifeline shall protect each employee. The lifeline shall be pr[redacted]l terminated to preclude a device such as a rope grab from[redacted]

Hori[redacted]o two persons at one time between supports and main[redacted]

Prior[redacted]lly inspect all fall arrest equipment for cuts, cracks, tears or abrasions, undue stretching, overall deterioration, mildew, operational defects, heat damage, or acid or other corrosion. Equipment showing any defect shall be withdrawn from service. All fall arrest equipment subjected to impacts caused by a free fall or by testing shall be removed from service.

Employees should store all fall arrest equipment in a cool dry place not subjected to direct sunlight.

Employees shall not use fall arrest equipment until they have been properly trained and show an understanding of its use.

Fall arrest equipment shall not be used for any other purpose, such as tow ropes or hoist lines.

Proper guardrails shall be installed on open sides of all walkways and runways where the fall distance exceeds four feet. Proper guardrails shall be installed on open sided floors where the fall distance exceeds six feet. All floor openings or floor holes shall be protected by guardrails or hole covers. If hole covers are used, they shall be strong enough to support the maximum intended load, secured against displacement, and properly labeled.

When operating a scissor lift work platform, the lift shall have guardrails on all open sides, with the door access chains or rails in place.

Employees operating aerial lifts shall wear a body harness and lanyard attached to the aerial lift. Employees shall not attach the lanyard to an independent structure.

Employees riding in a crane suspended work platform shall wear a body harness and lanyard attached to the grab rail of the platform.

Employees working on wall forms or rebar shall wear a body harness lanyard and/or positioning device when exposed to a fall in excess of six feet. Position devices shall be rigged to prevent a free fall greater than 24 inches.

Stairs, ladders, or ramps shall be provided for all access ways where there is a change in elevation greater than 19 inches.

When guardrails are used for fall protection, they shall consist of a top rail, intermediate rail, and t[redacted]vertical height of 42 inches, the midrail shall be at 21 inche[redacted]n wood railings are used, the post shall be of at least 2 inch [redacted]d 8 feet, the top rail shall be of at least 2 inch by 4 inch stock[redacted] of at least 1-inch by 6-inch stock. If pipe is used, it shall be at[redacted] structural steel is used, it shall be of 2 inch by 2 inch by 3/8-i[redacted]pe is used for railings, it shall have a diameter of at least 2 inc[redacted]llow no more than a 3-inch deflection.

Mani[redacted]ed as guardrails.

Emp[redacted]rdrails.

Personal fall arrest systems shall not be attached to guardrail systems.

4.2.4 Welding and Cutting

Before performing welding, cutting, grinding, or any other "hot work" in a hazardous area on a project site, employees shall obtain a Hot Work Permit (Form D). Hazardous areas are those areas where there is the presence or the potential of the presence of flammable or combustible materials, liquids, gases, vapors, mists, or dusts.

Only experienced and properly trained persons shall perform welding and cutting. Before welding or cutting is started, the area shall be inspected for potential fire hazards.

When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.

Suitable fire extinguishing equipment shall be immediately available at all locations where welding and cutting equipment is used.

Welders or their assistants shall not carry matches when engaged in welding or cutting operations.

A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard.

To protect the eyes, face, and body during welding and cutting, the operator shall wear an approved helmet or goggles, proper protective gloves, and clothing. Helpers or attendants shall wear proper eye protection. Other employees shall not observe welding operations unless they use approved eye protection.

Proper eye protection shall be worn to guard against flying particles when the helmet or goggles are raised.

Machinery, tanks, equipment, shafts, or pipes that could contain explosive or highly flammable materials shall be thoroughly cleaned and decontaminated prior to the application of heat.

In du[redacted] is a possibility of an explosion, welding or cutting equi[redacted]pace is adequately ventilated.

Welc[redacted]s, and other equipment so that it is clear of pass[redacted]

After[redacted] completed, the welder shall mark the hot metal or prov[redacted]workers.

Poter[redacted]terials used in fluxes, coatings and coverings, filler meta[redacted]materials released to the atmosphere during welding or cutti[redacted]tting, adequate ventilation or approved respiratory protection equipment shall be used. Special precautions shall be taken when using materials that contain cadmium, fluorides, mercury, chlorinated hydrocarbons, stainless steel, zinc, galvanized materials, beryllium, and lead. Employees shall refer to the Hazard Communication Program for specific requirements pertaining to the above listed hazardous materials (Section 4).

Gas Welding and Cutting – Only approved gas welding or cutting equipment shall be used. Approved backflow check valves shall be used on gas welding rigs in both gas and oxygen lines. Welding hose shall not be repaired with tape. Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or other approved device shall be used. Oxygen, acetylene, or fuel gas cylinders shall not be taken into confined spaces.

Electric Welding – Only approved electric welding equipment shall be used. The electric welding machine shall be properly grounded prior to use. Rules and instructions supplied by the manufacturer or affixed to the machine shall be followed. Welders shall not strike arc with an electrode whenever there are persons nearby who might be affected by the arc. When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contacts with employees or conducting objects. When the welder must leave his work or stop work for any appreciable length of time, or when the welding machine is to be moved, the power supply switch to the equipment shall be opened.

4.2.5 Rigging Equipment

All rigging equipment shall be sufficient strength, proper type, and safe for its intended use.

Rigging equipment shall not be loaded in excess of its recommended safe working load.

Prior to each use, all slings, fastenings, and attachments shall be inspected, by a competent person, for damage or defects. Damaged or defective equipment shall be immediately removed from service.

Makeshift lifting devices formed from bolts, rods, or reinforcing steel shall not be used.

Slings shall not be shortened with knots, bolts, or other makeshift devices.

Slings used in a basket hitch shall have the load balanced to prevent slippage.

Sling[redacted]oad by the use of hooks with retaining devices or by the use o[redacted]g device.

Sling[redacted]n the sharp edges of their loads.

A sli[redacted]a load when the load is resting on the sling.

Sling[redacted]he maximum practical angle between the sling leg and the h[redacted]

Shac[redacted]th bolts or other non-approved devices.

Only hooks with approved retaining devices shall be used. Hooks shall never be rigged so that they are points loaded at the tip of the hook unless they are designed for that purpose. The load shall be securely seated in the saddle of the hook.

When eyebolts are used, care shall be taken to ensure the bolt is not side loaded.

Chain falls, come-alongs, and other such devices shall not be loaded beyond their rated capacities.

Chain falls, come-alongs, and other such devices shall always be rigged for a straight pull.

The chain or hoist cable for chain falls, come-alongs, or other such devices shall not be wrapped around a load and used in place of a sling unless specifically designed for that purpose.

4.2.6 Excavation

Before excavation work begins, a Trenching and Excavation Notice shall be obtained. A separate permit must be obtained for each excavation (Form E).

All excavations five feet deep or deeper, and excavations shallower than five feet in unstable soil shall be sloped, braced, or shored to prevent cave-ins.

All excavations four feet deep or deeper shall have a ladder for access into the excavation with no more than 25 feet of lateral travel in any direction.

All excavated and available material shall be retained two feet or more from the edge of the excavation.

All excavations shall be barricaded with the appropriate barrier tape and other protective devices as required.

When entering an excavation that may be considered a hazardous environment by site safety representatives, proper personal protective equipment must be worn.

Full compliance with 29 CFR 1926.650 through .652 is required.

4.2.7

Woo as to obscure a defect in the wood; only a clear, nonc

All la y and regularly. Ladders with weakened, broken, or missi r defects shall be tagged and removed from service.

Ladd tly strong for their intended use.

Porta l in the vicinity of energized electrical circuits.

Ladd loors opening toward the ladder unless the door is open, locked, or guarded.

When ascending or descending ladders, employees shall have both hands free and shall face the ladder.

Only one employee shall work from a ladder at one time (except for hook type ladders). If two employees are required, a second ladder shall be used.

Ladders shall not be used as scaffold platforms.

Boxes, chairs, etc. shall not be used as ladders.

Straight Ladders

Portable straight ladders shall not be used without nonskid bases.

The ladder shall be placed so that the distance between the bottom of the ladder and the supporting point is approximately one-fourth of the ladder length between supports.

Straight ladders shall not be climbed beyond the third step from the top.

When working from a portable ladder, the ladder must be securely placed, held, tied, or otherwise made secure to prevent slipping or falling.

When dismounting from a ladder at an elevated position (as at a roof), the employee shall ensure that the ladder side rails extend at least three feet above the dismount position, or that grab bars are present.

Employees shall wear a body harness and lanyard, and tie off to a secure anchor whenever both hands must be used for the job or are exposed to a fall in excess of six feet.

Ladders shall not be spliced together to form a longer ladder.

A ladder shall not be placed against an unsafe support.

Emp[redacted] exposure greater than 24 feet shall be protected by an appr[redacted] or by the use of personal fall arrest equipment.

Step [redacted]

The t[redacted]on.

Step [redacted]nd the spreading bars locked in place.

Step [redacted]nt ladders.

Whe[redacted] ladder over six feet high, the employee shall use a body harn[redacted]antial anchor.

4.2.8 Material Handling

An employee shall obtain assistance in lifting heavy objects or power equipment shall be used. Back belts or back braces shall be used as required.

When two or more persons carry a heavy object that is to be lowered or dropped, there shall be a prearranged signal for releasing the load.

When two or more persons are carrying an object, each employee, if possible, should face the direction in which the object is being carried.

The right way to lift is easiest and safest. Crouch or squat with the feet close to the object to be lifted, secure good footing, take a firm grip, bend the knees, keep the back vertical, and lift by bending at the knees and using the leg and thigh muscles. Employees shall not attempt to lift beyond their capacity. Caution shall be taken when lifting or pulling in an awkward position.

Employees should avoid twisting or excessive bending when lifting or setting down loads.

When moving a load horizontally, employees should push the load rather than pull it.

When performing a task that requires repetitive lifting, the load should be positioned to limit bending and twisting. The use of lift tables, pallets, and mechanical devices should be considered.

When using such tools as screwdrivers and wrenches, employees should avoid using their wrists in a bent (flexed), extended, or twisted position for long periods of time. Employees should maintain their wrists in a neutral (straight) position.

When gripping, grasping, or lifting an object such as a pipe or board, the whole hand and all the fingers should be used. Gripping, grasping, and lifting with just the thumb and index finger should be avoided.

4.2.9 Hand Tools

All tools, regardless of ownership, shall be of an approved type and maintained in good condition. (Tools are subject to inspection at any time. A foreman has the authority and respo[redacted]e tools, regardless of ownership.)

Defe[redacted]nt their use or they shall be removed from the jobsite.

Empl[redacted] tool for the job performed.

Ham[redacted]vers, knives with metal continuing through the handle and [redacted]be used on or near energized electrical circuits or equi[redacted]

Tools[redacted] place or from person to person; tools that must be raised or lo[redacted]er shall be placed in tool buckets or firmly attached to hand lines.

Tools shall never be placed unsecured on elevated places.

All impact tools such as chisels, punches, drift pins, etc., that become mushroomed or cracked shall be dressed, repaired, or replaced before further use.

Chisels, drills, punches, ground rods, and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee.

Shims shall not be used to make a wrench fit.

Wrenches with sprung or damaged jaws shall not be used.

Pipe shall not be used to extend a wrench handle for added leverage unless the wrench was designed for such use.

Tools shall be used only for the purposes for which they have been approved.

Tools with sharp edges shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets.

Wooden handles that are loose, cracked, or splintered shall be replaced. The handle shall not be taped or lashed with wire.

All cutting tools such as saws, wood chisels, knives, or axes shall be kept in suitable guards or in special compartments.

Tools shall not be left lying around where they may cause a person to trip or stumble.

When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are present, or the danger area shall be barricaded or guarded.

The insulation on hand tools shall not be depended upon to protect users from shock.

4.2.[redacted]

The [redacted] portable electric tools such as drills, saws, and grinders shall [redacted] nected to a power source unless:

- Th[redacted] e-insulated type.
- Th[redacted] wer supply by means of an isolating transformer or ot[redacted] a 24-volt DC system.

All p[redacted] to use to ensure general serviceability and the presence of all[redacted] tric cord and electric components shall be given an espe[redacted]

Power tools shall be used only within their capability and shall be operated in accordance with the instructions of the manufacturer.

All tools shall be kept in good repair and shall be disconnected from the power source while repairs are being made.

Electrical tools shall not be used where there is a hazard of flammable vapors, gases, or dusts.

All power tools and cord sets shall be protected by ground fault circuit interrupters (GFCI).

4.2.11 Pneumatic Tools

Compressed air and compressed air tools shall be used with caution.

Pneumatic tools shall never be pointed at another person.

Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

Compressed air shall not be used for cleaning purposes except when reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

Compressed air shall not be used to blow dust or dirt from clothing.

The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.

The use of hoses for hoisting or lowering tools shall not be permitted.

All hoses exceeding ½-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure or disengagement of a connection.

Before making adjustments or changing air tools, unless equipped with quick-change conn[redacted]e air supply valve ahead of the hose. The hose shall be bled [redacted]nection.

Eye p[redacted]er protective devices shall be worn when their use could redu[redacted]

Pneu[redacted]by competent persons who have been trained in their use.

A pn[redacted]ntact exposed live electrical parts shall have a nonc[redacted]r to collect moisture.

Empl[redacted]ir bodies to locate or attempt to stop an air leak.

4.2.12 Cranes, Derricks, Hoisting Equipment

Only authorized persons shall be permitted in the cab or on the equipment.

Only those designated persons who are trained and qualified shall operate the hoisting equipment.

Cranes shall be inspected on a monthly basis.

No person shall be permitted to ride the hook, sling, or load of any hoisting equipment.

Load limits as specified by the manufacturer shall not be exceeded under any circumstances.

Operating and maintenance procedures as specified by the manufacturer shall be followed.

Before a lift is attempted, the lifting mechanism shall be level and firmly supported with the hoist line centered over the center of gravity of the load to be lifted.

No load shall be lifted until its weight has been determined.

For the first lift of each day, the load shall be test lifted and the brakes checked (load lifted several inches and then tested).

With every load, the slings and bindings shall be checked and shall be readjusted as necessary to ensure safety and stability.

Signals to the equipment operator shall be given by one person designated to perform this task. The operator shall, however, obey a "stop" signal given by anyone.

No employee shall be under a suspended load or inside the angle of a hoist line. No employee shall stand or work near a cable, chain, or rope under tension unless the nature of his work requires it.

Hoist lines, ropes, or wire cables shall not be guided by hand when standing within reach of the drum or sheave.

Wire rope loops shall be made by proper splicing or mechanical clamping of the tail section. Wire rope clips shall not be used to form eyes in wire rope bridles or slings.

Oper[redacted]at the controls of cranes, hoists, derricks, or other lifting devi[redacted]

Oper[redacted]d other hoisting equipment shall exercise extreme cauti[redacted]gized lines or equipment. The operator shall keep the equi[redacted]l lines energized up to 50 kV and 0.4 inch more for each 1 kV[redacted]

Tag l[redacted]

All s[redacted]he rated capacity.

4.2.13 Flammable and Combustible Liquids

"Danger – No Smoking" signs shall be posted around all flammable and combustible liquid storage areas.

Tanks shall be vented with a pipe not less than 1¼ inch inside diameter and shall be 12 feet high from the adjacent ground level.

Tanks shall be kept 20 feet from buildings.

At least one 20 pound Class B fire extinguisher shall be kept between 25 feet to 75 feet from tanks.

All tanks shall be properly grounded.

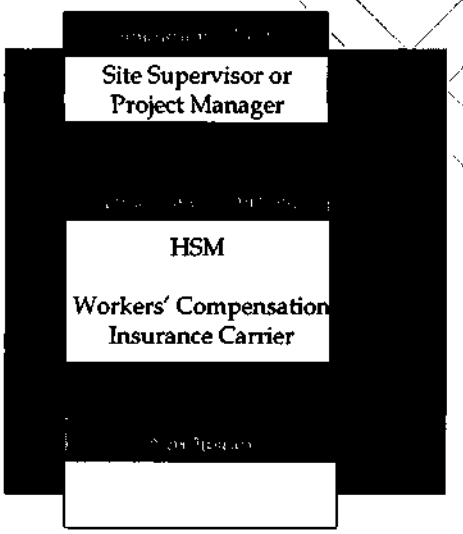
All tanks shall be labeled with the contents and owner's name.

4.3 Accident Reporting and Investigation

The Injury/Illness Report Form (Form A) will serve as the basis for the written reporting and investigating of all accidents resulting in employees receiving more than nonintrusive first aid. This includes any injury that requires offsite medical treatment or requires onsite first aid that hinders an employee's ability to function as normal (i.e., a sling or neck brace).

All such accidents are to be verbally communicated to the office HSM or the project manager as soon as medical services are secured. These individuals will verbally notify the HSM within eight hours of the accident.

Procedure for Completion of Injury/Illness and Workers' Compensation Reports



Necessary medical services and employee care are to be secured prior to the initiation of reporting and investigation. The investigation is to be thorough and performed, at a minimum, by the injured employee's immediate supervisor. The results of the investigation are to be documented using the report form, to be signed by the investigator. The form is then sent to the appropriate Project Manager, who, following a review, is also required to sign the form before forwarding it to the HSM. Following the HSM's review and signature, a copy of the form is to be made for the office/project file.

Required completion of a customer form cannot be substituted for Form A (i.e., both forms are to be completed). The form is to be completed for all accidents, including contractor employees and subcontractor's employees. In the event of an accident to a subcontractor employee, the form and investigation are to be prepared and performed by the subcontractor.

If the accident requires off-site medical treatment, the project manager or site supervisor may also have to complete a worker's compensation report. These reports vary from state to state; check with the HSM for appropriate forms.

4.3.1 Follow Up

If the injury/illness resulted from the uncontrolled release of hazardous material, the HSM is to be notified immediately so that discussions with the occupational physician can occur to determine if additional biological monitoring should be prescribed.

As soon as practical, following the initial medical treatment, the injured employee is to be scheduled into the clinic that administers the annual examinations for the injured employee's office. This is necessary to ensure that the employee receives quality medical treatment during any type or recovery period. This does not apply to a subcontractor employee.

Accident reporting procedures that are client-specific and applicable are also to be enacted at this time.

The HSM will follow up with the project manager to ensure that corrective action, if identified in the "Injury/Illness Report Form," has been implemented.

Section 5
Training

5.1 Introduction

Ensuring that employees have the appropriate skills to perform the tasks assigned to them safely is a key accident prevention tool. The three main goals of employee training are:

- Train employees to identify and evaluate hazards correctly
- Gi[redacted]standing of how to work in a safe manner
- Pr[redacted]ployees develop the attitude to want to work in a safe ma[redacted]

5.2

Emp[redacted]ssigned or new to the hazards and precautions applicable to th[redacted]w job; and when processes, hazards, or controls change.

The c[redacted]lude:

- Full 40 hour training as outlined in "Hazardous Waste Operations and Emergency Response" standard (HAZWOPER), 29 CFR 1910.120
- Comprehensive training on hazards and precautions specific to the employee's work
- A discussion of employee rights and responsibilities under OSHA regulations
- An explanation of who to contact with questions or concerns
- A review of this Health and Safety Program
- 30-minute site specific electrical hazard safety training

5.3 Refresher Training

Longer-service employees typically require refresher training when:

- One year has passed since initial HAZWOPER training (8-hours annually)
- Safety rules and regulations change
- Organizational structure changes (e.g., training in whom to contact)
- New equipment or procedures are introduced
- Additional skills, such as first aid, are needed

5.4 Supervisory Training

In addition to the initial and refresher training requirements, those individuals who supervise individuals performing asbestos clean-up activities at the 3rd West Substation site are required to have additional training. Topics included in this training include: CSHASP, Chemical and Physical Hazard Recognition, Spill Containment, Contingency Plans, Health Hazard Monitoring; i.e., subjects that help them perform activities in a safe and healthy fashion. Likewise, these individuals should be trained at the 40-hour AHERA/EPA Asbestos Contractor/Supervisor level and must be able to document current proof of refresher training.

5.5 Site Orientation

A th[redacted]eld to review the health and safety procedures required on si[redacted]rgency procedures are reviewed, and site security is expla[redacted]ave reviewed materials increasing their Libby ampl[redacted]actor coordination is addressed, if applicable. The site orien[redacted]loyee Meeting Record Form (Form B) and the CSHASP signa[redacted]gs are usually held by the Project Manager or the HSM. Subs[redacted]v site employees or subcontractors come on site. The Proje[redacted]e some site orientations to the HSM. The Project Man[redacted]or ensuring that the meetings are held.

5.6 [redacted]ngs

Site-specific discussions on work tasks and hazard control maintains employee safety awareness. Productive safety meetings include a review of actual field conditions and feedback and suggestions from employees. These site safety meetings are referred to as Toolbox Safety Meetings.

The HSMs hold Toolbox Safety Meetings on a routine basis, at a minimum. On certain projects, Toolbox Safety Meetings may be required daily. The degree of hazards, injuries, or accidents, and the number of employees/ contractors are factors that may warrant more frequent Toolbox Safety Meetings. Toolbox Safety Meetings discuss specific work tasks, the hazards involved, and controls for those hazards. The first Toolbox Safety Meeting is the site orientation and CSHASP review on the first day of the job.

Documentation of the meeting is recorded on the Employee Meeting Record (Form B), located in Appendix A. When only one or two employees are onsite, they may choose to attend the Toolbox Safety Meeting held by the subcontractor rather than hold their own. In this case, documentation of the personnel in attendance should be obtained and kept in the project files. Noting attendance in the log book alone is not acceptable.

5.7 Subcontractor Training

Subcontractors are solely responsible for ensuring appropriate training for their employees, agents, and lower tier subcontractor employees.

Depending on site operations, joint subcontractor Toolbox Safety Meetings may be appropriate. These joint meetings offer the opportunity to coordinate and improve common site safety

procedures, such as emergency evacuation and decontamination. Joint Toolbox Safety Meetings are held by the contractor HSM with subcontractors in attendance.

In addition to the joint Toolbox Safety Meeting, the subcontractors still must hold their own specific safety meetings in their area of expertise. The joint Toolbox Safety Meeting is in addition to the subcontractors' own safety meetings and does not serve to replace them.

5.8 Record Keeping

Records of site-specific training and weekly Toolbox Safety meetings are maintained by the project manager on the Employee Meeting Record (Form B), and copies are submitted at project comp[redacted]sary, to the HSM.

Orig[redacted], including health and safety forms, are kept with the othe[redacted]Documentation of training is maintained for a minimum of th[redacted]

5.9 [redacted]n

Emp[redacted]t the hazards of materials they work with. The right to know[redacted]ments of OSHA's Hazard Communication Standard (29 CFR [redacted]R 1910.1200 "Hazard Communication Standard" requi[redacted] using materials which may be hazardous, be advised and i[redacted] associated with those materials. The following sections outline the program designed for compliance with the scope and intent of the standard. The main elements of this program include a health and biological surveillance program, employee education and training program, and employee exposure determination program. It is only through the proper implementation and maintenance of such programs that maximum employee health and safety protection can be assured.

Each contractor's Health and Safety Manager (HSM) has overall responsibility for implementation of the Hazard Communication Program. The HSM will be responsible to ensure that programs have been implemented by the contractors.

5.9.1 Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) is an information sheet that provides specific identification information about a chemical or material. The MSDS information may include:

- Ingredients and hazards
- Physical data
- Fire and explosion information
- Reactivity data
- Health hazard information

- Spill risk and disposal procedures
- Special protection information
- Special precautions required for use

It is the manufacturer's responsibility to provide this information for any materials containing hazardous or potentially hazardous ingredients.

A comprehensive collection of MSDSs exists. Prior to any project startup, it is the contractors responsibility to ensure that MSDSs are available for any material expected to be utilized or enco[redacted]n represents a potential health and safety hazard to contr[redacted]exposure. MSDSs should be secured from the man[redacted]

Copi[redacted]cted to be utilized or encountered during project work are t[redacted]nd each employee is to be made aware that these exist and a[redacted]

5.9.[redacted]

It is t[redacted] Safety Manager (HSM) to ensure that all potentially haza[redacted]t site are labeled as to the contents of each container and the a[redacted]gs.

5.9.3 Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks (i.e., confined space entry, line breaking, tank cleaning, etc.), a special training session will be conducted to inform those employees as to the hazardous materials to which they may be exposed and the proper procedures and personal protective equipment to be utilized to minimize exposure potential.

5.9.4 Education and Training

Prior to any field project startup, a pre-project training session must be conducted with all employees expected to be involved with project work. Included in this training session are the following:

- An overview of the hazard communication requirement
- A review of the chemicals present and anticipated to be encountered during the course of the project
- Identification of the location and availability of the written hazard communication program, the inventory of chemicals expected to be utilized and/or encountered, and the MSDSs for those materials
- Discussion of the methods and observation techniques that may be used to detect the presence of a release of hazardous chemicals in the work area

- Discussion of how to lessen or prevent exposure to hazardous workplace chemicals
- Instruction in emergency procedures to follow if employees are exposed to hazardous chemicals
- An explanation of the hazard communication program, including how to read labels and MSDSs to obtain appropriate hazard information
- An explanation of the proper use of personal protective equipment

5.9.5 Informing Other Employees

Each [redacted] mployees have been provided access to information on the h [redacted] e. It is the responsibility of the HSM to ensure that the follo [redacted] ed:

- W [redacted]
- Th [redacted] ous chemicals to which employees may be exposed and th [redacted]
- A [redacted] m

Section 6
Respiratory Protection

Following are information and guidelines necessary for the proper selection, use, and maintenance of respiratory protective devices. These guidelines are applicable to all employees performing duties requiring the use of respiratory protection and are designed to comply with 29 CFR 1910.134.

6.1 [redacted]

Appr [redacted] ory by the National Institute for Occupational Safety and Heal

Conta [redacted] nuisance material in concentrations exceeding those norm

Disin [redacted] enic organisms, especially by means of chemical subs

Imme [redacted] *DLH)* - An atmospheric concentration of any toxic, corro [redacted] poses an immediate threat to life, would cause irreversible or delayed adverse health effects, or would interfere with an individual's ability to escape from a dangerous atmosphere.

Oxygen-Deficient Atmosphere - An atmosphere containing 19.5 percent or less of oxygen by volume.

Particulate Matter - A suspension of fine solid or liquid particles or fibers in air such as dust, fog, fume, mist, smoke, or sprays.

Pneumoconiosis-Producing Dust - Dust which when inhaled, deposited, and retained in the lungs may produce signs and symptoms of pulmonary disease.

Respirator - An approved device designed to provide the wearer with respiratory protection against inhalation of a contaminated atmosphere and, for some devices, oxygen-deficient atmospheres.

Vapor - The gaseous state of a substance that is solid or liquid at ordinary temperature and pressure.

Dusts - Solid particles, mechanically produced, with a size ranging from submicroscopic to macroscopic.

Fumes - Solid particles generated by condensation from the gaseous state, generally after volatilization from molten metals, with a size usually less than one micrometer in diameter.

Mists - Suspended liquid droplets generated by condensation or by breaking up of a liquid with a size ranging from submicroscopic to macroscopic.

Gases - Substances that are gaseous at ordinary temperature and pressures.

6.2 General Requirements

Respirators will be considered an acceptable method of protecting the health of personnel only under the following circumstances:

When it has been determined that there are no feasible engineering or work practice controls that [redacted] the hazard.

Duri[redacted]tions (one hour/day for one day/week).

Duri[redacted]ng controls are being designed and/or installed.

Duri[redacted]

As p[redacted]ossibility for an excessive or potentially hazardous cond[redacted]

Air p[redacted]vorn in atmospheres that contain at least 19.5 percent and [redacted]

The multiplicity of hazards that may exist in a given operation requires a careful and intelligent respirator selection. The selection is made complex by the many types of respirators available. Each type has its special limitations, application, operational and maintenance requirements. For these reasons it is important that the individual responsible for the respiratory program be trained and knowledgeable in the basic principles of respiratory selection and use.

The standards governing the development of this program include but are not limited to the following:

American National Standard Institute (ANSI): Practices for Respiratory Protection, Z88.2-1992

OSHA: Respiratory Protection, 29 CFR 1910.134 and 29 CFR 1926.103

6.3 Medical Surveillance

Each site employee will be evaluated for entering into a Medical Surveillance Program. If the specific job task assigned requires working at or above any applicable PEL or published exposure level, or if the employee is performing clean-up tasks, they will automatically be entered into a medical surveillance program. Employees will not be assigned to tasks requiring the use of respiratory protection unless they have been determined to be physically able to wear such equipment.

6.4 Selection of Respiratory Protective Devices

Selection of respiratory protective devices for projects that require the use of such personal protective equipment is performed during the generation of SHASPs and/or AHAs as described in Section 5. Information contained in Table 6-1, "Protection Factors," is used in the selection process.

When selecting the correct respiratory protective devices, there are several factors that must be considered, including:

Nature of the Hazard. Before selecting a respirator, the nature of the inhalation hazard must be iden[redacted]l hazards, chemical properties, movement and work rate limit[redacted]trations and warning properties are all factors that must be co[redacted]

Natu[redacted]ctual operation and/or process that is creating the haza[redacted]riate respiratory protection.

Resp[redacted]here are limitations associated with each type of respi[redacted]nitations are discussed in Table 6-2.

The S[redacted]lection of respiratory protective devices. Generally speal[redacted]ctive equipment is required, it will consist of at least a half-[redacted]es. When supplied air respirators are required, they will be equipped with emergency escape bottles.

The descriptions and limitations of respiratory protection devices included in Table 6-2 are extracted from 30 CFR 11.

Table 6-1
Respiratory Protection Factors*

Respirator	*Protection Factor*
I. Particulate Filter Respirators	
- Powered air-purifying respirator with high-efficiency particulate filter (full-face).	1,000
- High-efficiency particulate filter respirator with a full facepiece.	100
- High-efficiency particulate filter respirator with a half facepiece.	10

* *Adapted from ANSI Z88.2*

Definition: Ratio of contaminant concentration outside respirator to inside.

Use: Allows calculation of maximum use concentration in which a particular type of respirator will provide adequate protection to wearer [i.e., (PEL) x (P.F.) = maximum use concentration].

Table 6-2
Respiratory Protection Devices

General Description	Limitations	Requirements
Air Purifying Respirators		
[redacted]	t protect against oxygen ent (<19.5%) atmospheres ospheres that are diately dangerous to life ealth (IDLH). The method ification is generally cal or chemical group ic so they cannot be used ospheres that contain wn concentrations of wn materials. Also cannot ed in atmospheres ning chemicals that nt a health risk below their r taste thresholds. The life of this type of respirator is limited to the concentrations of contaminants, the breathing demand of the wearer, and the removal capacity of the purification medium.	When Level C respiratory protection devices are specified, they will consist of a full-face respirator with an MSA GMC-H (NIOSH approval number TC-23C-1283) cartridge or equivalent. Alternative respirators and cartridges must be approved by the HSM.
Atmosphere-Supplying Respirators		
A respirable atmosphere is supplied independent of the ambient air surrounding the wearer. These devices provide protection against oxygen deficiency and most toxic atmospheres.	Some limitations of atmosphere supplying respirators include time limitations of supplied air, bulkiness of equipment, and inherent safety hazards associated with working while dragging an airline or while wearing an air cylinder.	SCBAs will be pressure-demand types of devices, and where appropriate, equipped with an emergency escape bottle.

6.5 Training

Respirators will not be issued to employees who have not been adequately trained in their use. At a minimum, all employees and supervisory personnel who may be required to wear respiratory protective devices will receive training in the following:

- Problems associated with improper respirator usage.
- Th[redacted]h airborne contaminants.
- Th[redacted]spirator types.
- Th[redacted]ce of respirators.
- Th[redacted]ative field fit checks each time respiratory protection is do[redacted]e of the facepiece-to-face seal and of not using re[redacted]chievable.
- Th[redacted]pirators are not interchangeable.
- H[redacted] protective devices prior to use.
- Successful completion of a fit test for the specific respirator that is to be used.
- Documentation of training is completed for each individual and maintained in the training tracking system. An example of the respirator training form documentation appears as Form H.

6.6 Fit Testing and Field Checks

Fit testing will be performed on all employees assigned to project work that may require the use of respiratory protective devices. Testing will be performed by the HSC or another trained and qualified individual in accordance with accepted fit test procedures. Documentation of fit testing is completed for each tested employee and maintained in the training tracking system. Positive and negative pressure field checks are performed immediately prior to use.

6.7 Inspection

All respirators are inspected before and after use. Respirators stored for emergency use only are inspected monthly. Inspections generally cover the following:

- Condition of facepiece, connecting tubes, cartridges, and straps.
- Condition of the lens. Lenses should be free of scratches and seated tightly in retainers.
- Flexibility of all rubber parts. Deteriorated pieces should be replaced.

- Condition of all valves. Exhalation and inhalation valves are to be checked to ensure correct seating.

- On self-contained breathing apparatus (SCBA), air cylinder charges, regulators, and warning devices are to be inspected prior to use by individuals trained to perform these inspections. For units stored for emergency use, these inspections are to occur at least monthly.

6.8 Use, Maintenance, and Care

Employees are not assigned to tasks requiring the use of respiratory protection unless they have been determined to be physically able to wear such equipment, have been trained, and have comp

Empl tors must be clean shaven. Additionally, anything that inter l (i.e., glasses, long hair, skull caps, etc.) will not be perm d.

All r NIOSH/MSHA approved.

Only be used in respirator repair. Maintenance on self-conta y be performed by individuals certified by the manu

Resp e individual will be cleaned and sanitized after each use. Extreme care is to be taken during the cleaning process to prevent damage from handling.

When not in use, respirators will be stored to protect them from physical damage, sunlight, extreme temperatures, and excessive moisture.

6.9 Breathing Air

When used, breathing air will be Grade D or better as per the specifications described by the American National Standard Institute.

Section 7
Site-Specific Health and Safety Plans

Site-specific health and safety plans (SHASPs) or Activity Hazard Analyses (AHAs) may be generated for all clean-up activities and hazardous waste sites. The complexity of each individual plan will vary as to the types of operations and the chemical and physical exposure hazard potential associated with each individual site.

At th[redacted]manager should complete the Preliminary Hazard Anal[redacted]ial assessment of potential health and safety concerns on the p[redacted]a complete SHASP or AHA is required.

Shou[redacted], it will serve as a vehicle for providing health and safety infor[redacted]to site activities and will be available onsite and revie[redacted]before performing site activities. Documentation as to this r[redacted] general, the SHASP or AHA will be prepared, as a mini[redacted]irements of 29 CFR 1910 and 29 CFR 1926.

Perti[redacted]a SHASP or an AHA are as follows:

- To[redacted]to protect employees and the public from potential site-specific health and safety hazards
- To provide measures to minimize/eliminate accidents and injuries that may result from chemical and physical hazards associated with the site
- To ensure that all aspects of site operations have been carefully thought out prior to initiation of any site tasks
- To communicate to site employees the chemical and physical hazard potentials that exist at the site; how those hazards can impact their health and well-being; and the personal protection equipment and procedures required to minimize those hazards
- To assure that all potential contingencies have been thoroughly examined in advance of injuries, illnesses, fires, or other catastrophic events

7.1 Elements

The SHASP and AHA will address, at minimum, the following:

- *Names of key personnel and alternates responsible for the implementation and maintenance of the SHASP or AHA.* This section will describe these personnel and the lines of communication to be followed in performance of the project work.
- *A health and safety risk analysis for each anticipated site task and operation.* This will include a discussion of the materials thought to be on site, their health and safety hazard potentials, etc. Also to be included in this section is a discussion concerning the types of equipment and

physical hazards associated with the operation of equipment that will be required to perform the project work.

- *Site-specific health and safety training that will be provided to all employees participating in project work.* This training will include, at a minimum, the requirements of the SHASP or AHA and will be provided by the designated health and safety manager (HSM).

- *Initial personal protective equipment requirements specified for each anticipated site task and operation.* This equipment will be prescribed based on materials suspected as being on site and the activities associated with these materials.

- *Medical surveillance requirements, when different from this CSHASP.* Additional medical su[redacted]e occupational physician who oversees the medical su[redacted]ed.

- *Th[redacted]al and environmental air quality sampling, defined by specific, an[redacted]ifics as to types of equipment, sampling and analytical m[redacted]nent operation, calibration, and maintenance, will also be[redacted]

- *De[redacted] will include site delineation (i.e., exclusion, co[redacted]rt zones), procedures for site entry and exit, the use of a "b[redacted]s, site-specific safe work practices, and the identification of[redacted]

- *Site-specific equipment and personnel decontamination procedures.*

- *Standard operating procedures that are specific to the site.*

- *A contingency plan, to be implemented in the event of injury/illness, fires, etc.*

- *Confined space entry procedures, as necessary.*

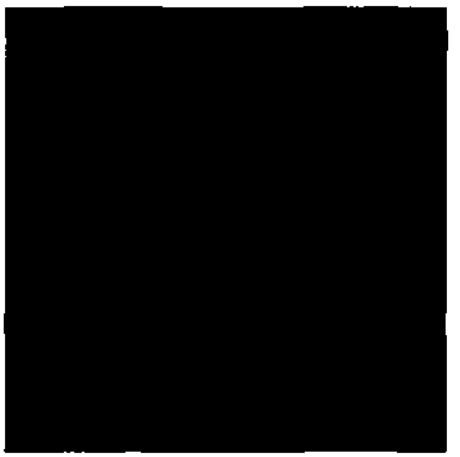
- *Site excavation guidelines, where required.* These will be shared and/or sloped as per Subpart P of 29 CFR Part 1926.

The HSM is responsible for reviewing all SHASPs and AHAs for site-specific project work. This review is performed to ensure that health and safety hazard potentials have been considered for all anticipated project work. No work associated with hazardous waste sites will be performed until an acceptable SHASP or AHA has been submitted. This document is accepted upon signature by the HSM. A copy of all SHASPs and AHAs amendments will be maintained in Appendix B of this CSHASP document.

7.2 Site-Specific Plans

A site-specific plan will be developed using a standard SHASP form (Form G) or Activity Hazard Analysis form (Form J) for activities associated with the 3rd West Substation site.

The SHASP can be supplemented by Activity Hazard Analysis data sheets that outline health and safety concerns associated with particular, specific tasks (e.g., excavations, fall protection, confined space entry, etc.). These sheets may be obtained from the HSM.



Section 8
Temperature Extremes

8.1 Introduction

A majority of project activities are performed in outdoor locations and, as such, employees occasionally perform these activities in elevated and depressed temperatures extremes. In light of this, it's important that all employees understand the signs and symptoms of potential injuries associated with working in temperature extremes.

8.2

Heat siological processes fail to maintain a normal body temp The body reacts to stress related to heat a number of diffe m mild, such as, fatigue, irritability, anxiety, and decre as death. Heat related disorders are generally classified into t cramps, heat exhaustion, and heat stroke. The desc for these diseases are described as follows.

Heat
Desc ntinuous exposure to heat and humid air and is generally aggravated by coarse clothing. This condition decreases the ability to tolerate heat. This condition is the mildest of heat related disorders.
Symptoms - Mild red rash that is generally more prominent in areas of the body in contact with personal protective equipment.

Treatment - Decrease the amount of time in personal protective equipment and use powder to help absorb moisture.

Heat Cramps
Description - Heat cramps are caused by perspiration that is not off-set with adequate fluid intake. This condition is the first sign of a situation that can lead to heat stroke.

Symptoms - Acute, painful spasms occurring in the voluntary muscles (e.g., abdomen and extremities).

Treatment - Remove victim to a cool area and loosen clothing. Have victim drink 1-2 cups of water immediately and every 20 minutes thereafter until the symptoms subside. Total water consumption should be 1-2 gallons per day. Consult with a physician.

Heat Exhaustion
Description - Heat exhaustion is a state of very definite weakness or exhaustion caused by the loss of fluids from the body. This condition is more severe than heat cramps.

Symptoms - Pale, clammy, moist skin with profuse perspiration and extreme weakness. Body temperature is generally normal and the pulse is weak and rapid. Breathing is shallow. The victim may show signs of dizziness and may vomit.

Treatment - Remove the victim to a cool, air conditioned atmosphere. Loosen clothing and require that the victim lay in a flat position with the feet slightly elevated. Have the victim drink 1-2 cups of water immediately and every 20 minutes until the symptoms subside. Seek medical atten[redacted]ns.

Heat
Desc[redacted]d dangerous situation. It can happen in a very short time peric[redacted]l system shuts down completely resulting in a rise in body[redacted]n cause brain damage and can be fatal if not treated prom[redacted]

Sym[redacted] perspiring. Rapid respiration, high pulse rate, and extre[redacted]ther symptoms.

Treat[redacted]he body temperature is not brought down fast, permanent brain damage or death can result. The victim should be soaked in cool water. Get medical attention as soon as possible.

8.2.1 Prevention Measures

There are a number of steps that can be taken to minimize and/or eliminate the potential for heat stress disorders when working in hot atmospheres. Some of these are as follows:

- Acclimate employees to working conditions by slowly increasing workloads over extended periods of time. Do not begin site work activities with the most demanding physical expenditures.
- Where possible, conduct strenuous activities during cooler portions of the day, such as, early morning or early evening.
- Provide and encourage all employees to drink lots of tempered water during the course of the work shift and discourage the use of alcohol during nonworking hours. It's essential that fluids lost due to perspiration get replenished.
- During hot periods, use administrative controls to limit exposure.
- Provide cooling devises when appropriate. Mobile showers and/or hose down facilities, powered air purifying respirators, and ice vests have all proven effective in reducing heat stress potential.

8.2.2 Heat Stress Monitoring

For strenuous field activities that are part of ongoing site work activities in hot weather, the following procedures are used to monitor the body's physiological response to heat. These procedures are implemented when employees are required to wear impervious clothing in atmospheres exceeding 70°F.

- Monitor Heart Rate (HR) - Heart rate should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The measurement at the beginning of the rest period should not exceed 110 beats/minute. If the heart rate is in excess, the next work period should be shortened by 33 percent, with the length of the rest period remaining the same. If th[redacted]eginning of the next rest period, the following work cy[redacted]ent. This procedure continues until the rate is ma[redacted]

- M[redacted]mperature is measured orally or by ear with a clinical th[redacted]he resting period. Temperatures should not exceed 99[redacted]d should be shortened by 33 percent. If the oral te[redacted]ork period still exceeds 99.6°F, the following work cycle is [redacted]his procedure continues until the body temperature is ma[redacted]

The [redacted]GT) Index is a method of monitoring environmental factors [redacted]individual's physiological response to heat. This method uses a black globe thermometer, a natural wet-bulb thermometer, and a dry-bulb thermometer. From measurements with these instruments, the WBGT can be calculated. The WBGT is then compared with work load categories with the result being the establishment of recommended work/rest regimens. Examples of permissible heat exposure threshold limit values are as follows.

Examples of Permissible Heat Exposure Threshold Limit Values (Values are given in °C and (°F) WBGT*)

	Work Load		
Work-Rest Regimen	***Light***	***Moderate***	***Heavy***
Continuous work	30.0 (86)	26.7 (80)	25.0 (77)
75% work - 25% rest, each hour	30.6 (87)	28.0 (82)	25.9 (78)
50% work - 50% rest, each hour	31.4 (89)	29.4 (85)	27.9 (82)
25% work - 75% rest, each hour	32.2 (90)	31.1 (88)	30.0 (86)

* As workload increases, the heat stress impact on an unacclimatized worker is exacerbated. For unacclimatized workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5°C.

8.3 Cold Stress

Persons working outdoors in low temperatures, especially at or below freezing, are subject to cold stress disorders. Exposure to extreme cold for even a short period of time can cause severe injury to the body surfaces and/or profound cooling which can lead to death. Areas of the body that have high surface area-to-volume ratios, such as, fingers, toes, and ears, are the most susceptible.

There are basically two types cold disorders. They can be classified as localized, as is the case with frostbite, or generalized, as in hypothermia. The descriptions, symptoms, and treatment for these diseases are described as follows.

Hypo
Desc body drops, the thermo-regulatory system attempts to
incre This regulation includes the constriction of surface blood
vesse ly's production of glucose, to increase the body's
meta generate heat.

Symp ith the sensation of cold. Slower heartbeat and a weaker
pulse

Treat nvironment.

Frost
Description - Frostbite is a condition in which the fluids around the cells of body tissues freezes. The condition results in damage to and loss of tissue. The most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes.

Symptoms - Affected areas become white and firm.

Treatment - Get the individual to a warm environment and rewarm the areas quickly. Keep affected areas covered and warm. Warm water can be used to thaw the areas.

8.3.1 Preventive Measures

There are a number of steps that can be taken to minimize/eliminate the potential for cold stress disorders when working in a cold environment. Some of these are as follows:

- As with warm environments, individuals can achieve a certain degree of acclimation when working in cold environments. The body will undergo some changes that will increase the body's comfort and also reduce the risk to cold injury.

- Working in cold environments causes significant water losses through the skin and the lungs as a result of the dryness of the air. Increased fluid intake is essential to prevent dehydration, which effects the flow of blood to the extremities and increases the risk of cold injury. Warm, sweet, caffeine-free, nonalcoholic drinks and soups should be readily available.

- Do not allow skin to be continuously exposed to sub-zero temperatures.

8.3.2 Cold Stress Monitoring

Air temperature alone is not sufficient to judge the potential for cold-related disorders in a particular environment. Heat loss from convection, air movement at the surface of the skin, is probably the greatest and most deceptive factor in the loss of body heat. For this reason, wind speeds as well as air temperatures need to be considered when evaluating a potential for cold stress disorders. The resultant windchill index and the potential danger to exposed individuals have been tabulated as shown in Table 8-1.

Table 8-1
Windchill Index

	Actual Thermometer Reading (F)									
Wind Speed in mph	***50***	***40***	***30***	***20***	***10***	***0***	***-10***	***-20***	***-30***	***-40***
	Equivalent Temperature									
[redacted]				20	10	0	-10	-20	-30	-40
				16	6	-5	-15	-26	-36	-47
				4	-9	-21	-33	-46	-58	-70
				-5	-18	-36	-45	-58	-72	-85
				-10	-25	-39	-53	-67	-82	-96
				-15	-29	-44	-59	-74	-88	-104
				-18	-33	-48	-63	-79	-94	-109
				-20	-35	-49	-67	-82	-98	-113
				-21	-37	-53	-69	-85	-100	-116
C (littl				erson)	Increasing Danger (Danger from freezing of exposed parts)			Great Danger (Danger from freezing of exposed parts)		

The human body senses "cold" as a result of both air temperature and wind velocity. Cooling of exposed flesh increases rapidly as the wind velocity goes up. Frostbite can occur at relatively mild temperatures if wind penetrated the body insulation. For example, when the actual air temperature of the wind is 4.4 C (40 F) and its velocity is 48 km/h (30 mph), the exposed skin would perceive this situation as a equivalent still air temperature of -11 C (13 F).

Appendix B
c Health and Safety Plans

Appendix C

H[redacted] Protocol for Contractors and Subcontractors

Appendix C

Health and Safety Protocol for Contractors and Subcontractors

The Project Health and Safety Program is designed to coordinate the overall Health and Safety effort during clean-up. The Project Health and Safety Program does not relieve a contractor of his c[redacted]nd safety, or any applicable governmental regulations.

Cont[redacted] health and safety of all persons and property affected by their [redacted]g work performed by their subcontractors. This requi[redacted]uring the entire contract period and shall not be limited just t[redacted]

Cont[redacted] implementation of a written Health and Safety Program (Sub[redacted]vent their employees from working under conditions that [redacted]r health and safety. Contractors' conformance with the requi[redacted]ch a program is mandatory under the provisions of their const[redacted]

Contractors shall designate a qualified safety representative to be responsible for the administration of the Contractors' Safety Programs and the Project Health and Safety Program. Contractors shall also be responsible for the administration of the Contractors' Safety Programs and the Project Health and Safety Program for their subcontractors.

1.0 Program Requirements

The Contractors' Safety Program shall meet the minimum applicable requirements of the Occupational Health and Safety Act of 1970 as amended. The following additional requirements are a mandatory part of each contractor's Safety Program to meet the minimum requirements of the Project Health and Safety Program:

Deliver one copy of the contractor's Safety Program to PacifiCorp for review.

Submit to PacifiCorp, as part of the Safety Program, a Designation of Competent Person form that designates a competent person for each area listed that is applicable to their work. OSHA defines a competent person as, "One who, through training and experience, is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." Contractors' competent persons shall be the competent person for each subcontractor unless otherwise indicated.

Participation in the daily Toolbox Safety Meetings.

Cooperation with federal, state, and local agencies concerning health and safety and property damage matters as they concern.

Participation in the implementation of fire control measures as may be appropriate for the protection of individuals and property.

Provide training and education, and the documentation thereof, to the contractor's employees in the recognition, avoidance, and prevention of unsafe working conditions and unsafe work pr

Mair ords and statistics, as required, and making available su uest, for their periodic review.

A sy d by the Project Health and Safety Program are su nanner.

Conc fety inspections with written reports submitted weekly to s shall be deficiencies detected and corrective action tal

A sy injuries, accidents, illnesses, fires, hazardous material spills, and unsafe conditions and procedures to the contractor's safety representative or designee.

Systems of daily Toolbox Safety Meetings are to be held and documented for all contractors' employees. A copy of the Weekly Safety Meeting Report must be submitted to PacifiCorp. Weekly toolbox report forms can be obtained from PacifiCorp.

Provide a system to prevent the use of unsafe or defective equipment, tools, materials, or machinery, which includes procedures for tagging and/or lockout to render such unsafe items inoperable.

Provide a system to ensure that only employees who are qualified by training or experience are allowed to operate equipment, tools, and machinery.

Provide appropriate first aid/medical coverage for all of its employees and provide PacifiCorp with weekly first aid logs.

Adhere to PacifiCorp's Activity Hazard Analysis (AHA) Policy.

Designate a qualified representative to be responsible for rigging and heavy lifting. A report must be submitted to, and approved by, PacifiCorp prior to any lifts over 20 tons. The following items shall be included in the report:

- Make and model number of cranes or hoist

- Lift radius, boom angle, and boom length, if applicable
- Lifting capacity of crane or hoist for the particular configuration
- Size and capacity of all rigging
- Weight of object being lifted and associated rigging
- Diagram of lift layout

Documented programs related to health and safety that are required by contractors include:

Haza[redacted]e protection of employees who are required to handle or us[redacted]aterials, poisons, caustics, and other harmful substances. Th[redacted] to create an employee awareness of potential hazards of su[redacted]ersonal hygiene for those exposed to those hazards, the pe[redacted]vices required, and the emergency notification pr[redacted] an accident.

Conf[redacted]loyees who are required to enter confined or enclosed sp[redacted] nature of the hazards involved, the necessary pr[redacted]er use of required protective and emergency equipment.

Personnel Protective Equipment Program for employees who require the use of personal protective equipment because of the hazards of the work being performed.

Equipment Inspection Guidelines. A program that provides for periodic documented inspections of all equipment in accordance with applicable federal, state, and local regulations.

Written Orientation Program that includes the following: job hazard analysis, emergency communication procedures, and disciplinary procedures; Project Health and Safety Program requirements; and OSHA requirements. Records of such training shall be maintained onsite by the contractor and made available upon request for inspection by PacifiCorp.

2.0 Surveillance Policy and Procedures

Contractors are responsible for the enforcement of their respective Safety Programs and the Project Health and Safety Program. PacifiCorp will provide surveillance of contractors' activities to observe whether such activities are in compliance with the Project Health and Safety Program and contractors' Safety Programs.

2.1 Violation Notification Procedures

In the event of an apparent violation of a safety or health standard, PacifiCorp will advise the contractor of the violation and direct that the violation be corrected. If there is a conflict between Project Health and Safety Rules, contractors' Safety Program rules, and governmental regulations, the most restrictive rules shall apply.

Occupational Health and Safety Violation Notice (Written Warning Letter)

The contractor will be informed of identified violations of health and safety standards by means of an Occupational Safety/Health Violation Notice. Violation notices will be delivered by the most expeditious method to the contractor's onsite construction office. The contractor will receive an original plus one copy of each violation notice.

The contractor shall take corrective action within the abatement period shown on the violation notice or propose an alternate solution within the abatement period given. If corrective action is not taken within the abatement period, work shall stop in the respective location, and/or the affec[redacted]til the cited violation is corrected.

Whe[redacted]eted, the contractor shall state in writing the corrective actio[redacted] notice, and return it to PacifiCorp.

Ther[redacted]

Serio[redacted]hich is causing or likely to cause death or serious ph[redacted]

Non-[redacted]ce which is not likely to cause death or serious physical ha[redacted]

Stop Work/Imminent Danger – The existence of any condition or practice, which would reasonably be expected to cause death or serious physical harm before such condition, or practice can be corrected. This is a "stop work" situation. All persons shall be withdrawn from the affected area, and no one shall be allowed in such area except those people deemed necessary to correct the condition or practice.

Stop Work Noncompliance – A violation (serious or non-serious) described in a notice, which has not been totally corrected within the noted abatement time, and the abatement time should not be extended. This is a "stop work" situation. All persons shall be withdrawn from the affected area, and no one shall be allowed in such area except those people deemed necessary to correct the condition or practice.

2.1.1 Imminent Danger Notification

If PacifiCorp considers a violation to be imminently dangerous to life, limb, or property, the contractor's representative at that location will be directed to immediately cease work in that area. The imminent danger condition shall be corrected to the satisfaction of PacifiCorp before work is allowed to continue.

2.1.2 Repeated Violations

In addition to the above notification procedures, PacifiCorp will notify the contractor's corporate office if a particular violation is repeated or the contractor's field supervisor is not

cooperative. Such notification to the contractor's corporate office may be either by telephone or in writing; however, telephone notifications will be followed up with written notification.

Repeated nonconformance with the Project Health and Safety Program and repeated failure to comply with correction directives may result in removal of contractor management from the project site or termination of the contract.

2.2 Abatement

In the event that the safety or health hazard noted on the Occupational Safety/Health Violation Notice is not abated within the time period specified and no alternate solution has been prop[redacted]will initiate steps to correct the violation and back-charg[redacted]

2.3 [redacted] Health and Safety Violation

For c[redacted]gly violate the Project Health and Safety Program, a Heal[redacted]iolation will be issued. If any one employee should recei[redacted]on, disciplinary action will result which may include term[redacted]s who knowingly or willfully violate Project Health and Safet[redacted] discharge without prior warning.

Whe[redacted]issued to an employee, a copy will be forwarded to their employer. Personal Notice of Violation may be issued to contractor supervisor for not enforcing the Project Health and Safety Program rules with the employees under their supervision. Employees terminated for violation of Project Health and Safety Rules shall not be eligible for rehire for the duration of the project.

3.0 Tagging Equipment Out of Service

The tagging and clearance procedures for placing defective equipment, tools, or cords out of service at the clean-up project shall be strictly adhered to. In the event that a health and safety hazard is recognized by PacifiCorp, the affected equipment will be tagged with a "Danger" tag, immediately taken out of service, and will remain out of service until the defect is corrected.

The contractor representative shall remove the "Danger" tag from the equipment after corrective action has been completed. The contractor shall state in writing on the tag the corrective action taken, date and sign the tag, and return it to PacifiCorp. Anyone removing this tag before corrective action has been completed shall be subject to immediate termination of employment.

4.0 Project Health and Safety Program Operation

PacifiCorp will distribute to all contractors copies of the Project Health and Safety Manual. The contractors will ensure that all of their employees and subcontractors are familiar with and abide by the contents of this manual, including any changes promulgated and distributed by PacifiCorp.

PacifiCorp will schedule project safety meetings as needed. The purpose of the meetings will be to discuss health and safety concerns as they relate to all construction projects, provide for two-way communication between the contractor's safety representatives and PacifiCorp, and, in general, further the Project Health and Safety Program. All contractors are required to have their safety representative in attendance.

4.1 Accident/Incident Reporting

All injuries, occupational illnesses, accidents, and unsafe conditions are to be investigated by the contractor's safety representative. The safety representative shall complete an Accident/Illness Investigation Report form. The safety representative shall submit the comp[redacted] Safety Manager along with any supportive information such [redacted]ts, etc., within two working days after the accident happ[redacted]gned by the contractor's safety representative.

In th[redacted] property damage accident, or any damaging fire, Pacif[redacted]d regardless of the day or hour. This reporting requi[redacted]ements outlined in the above paragraph.

5.0 [redacted]cedures

A re[redacted] accompany agency representatives during inspections of the c[redacted]OSHA, each contractor will require his employees to select a representative(s) to accompany the OSHA compliance officer during site inspections.

The Site Health and Safety Manager shall examine the compliance officer's credentials prior to the start of any onsite inspection. At all times while onsite, the OSHA representative shall be treated courteously and given full cooperation.

6.0 Safety Policy Memoranda

From time to time, as the need is identified, PacifiCorp will issue safety policy memoranda that affect the entire project. Safety policy memoranda will be identified by a number and a specific safety subject, such as Safety Policy Memorandum 1 (Scaffolding). Safety policy memoranda will be issued to all persons who have received a Project Health and Safety Manual. They are to be inserted at the end of this manual.

The person responsible for the receipt and maintenance of the manual shall also be responsible for informing his firm's employees and subcontractors of the contents of the safety policy memoranda.

Safety policy memoranda will have an effective date and an expiration date. Prior to the expiration date, the Site Health and Safety Officer will review the memorandum and either reissue or direct that the memorandum be removed from the manual.

7.0 Housekeeping

Contractors shall, at all times, maintain the premises free from accumulations of waste material, trash, and debris caused by their work. Each work area shall be cleaned and swept each day, if applicable, by the contractor or more often if necessary to remove fire and safety hazards discovered through regularly scheduled inspections. All tools, scaffolding, and materials shall be removed from the work area at the completion of the work. All scrap, waste material, and rubbish shall be removed from the work area daily.

Pre-job planning shall include consideration of housekeeping plans and will include methods and equipment or tools necessary. The contractor's supervisors shall be instructed by the conti ing.

All r usekeeping from PacifiCorp shall be acted upon imm maintaining good housekeeping can result in the follo

Back val of trash, rubbish, and waste materials from the work ar aisles, walkways, and work areas of tools, material, and eq

Repo ntractor performance

Suspension of the work until a proper level of housekeeping is achieved

8.0 Ground Fault Protection

Ground fault circuit interrupters shall be used with all power tools and cords. These shall be used regardless of the power source, including portable and wheel mounted generators. The ground fault circuit interrupter shall be tested before each use.

9.0 Crane Inspections

All cranes in use on the project shall be inspected on a monthly basis by a competent person. Inspection results shall be recorded on a Monthly Crane Inspection Report form, which must be submitted to the Site Health and Safety Manager by the fifth working day of each month.

Additionally, the contractor shall submit a current annual crane inspection report to the Site Health and Safety Manager for each crane used on the project. Annual crane inspection reports shall be submitted prior to placing the crane in service. The annual inspection shall be performed by a competent person or by a government or private agency recognized by the U.S. Department of Labor. The contractor shall maintain a record of the dates and the results of inspections for each hoisting machine and piece of equipment.

Failure to submit the above inspection report will result in a violation notice, which will stop the use of the crane in violation until the required reports are submitted. Whoever knowingly makes any false statement, representation, or certification either a monthly or an annual crane inspection report shall be subject to immediate discharge and will be barred from the project.

The above policy shall in no way eliminate any requirements for crane inspection set forth in the OSHA Standard 1926.550.

10.0 Hazardous Material Program

It is the contractor's sole responsibility to implement and maintain a written Hazard Communication Program as stated in OSHA Standard 29 CFR 1910.1200. Contractors shall submit a copy of their written Hazard Communication Program to the Site Health and Safety Manager prior to beginning work onsite.

Contractors shall submit a Material Safety Data Sheet to the Site Health and Safety Manager for any a[redacted]ng onsite or are responsible for. The Material Safety Data[redacted]he material arriving onsite.

If a c[redacted] material could affect the health and safety of other contr[redacted]hall coordinate the work with the other contractors to ensu[redacted]ractors' employees.

Cont[redacted] safe storage, use, and disposal of all hazardous material they [redacted] Contractors shall conspicuously label all containers of haza[redacted]e for with their company name.

If the[redacted]ctors or any of their representatives or employees encounters or has reason to believe contaminated soil or groundwater exists during excavations for project facilities, the contractor shall immediately notify the Site Health and Safety Manager. The Site Health and Safety Manager or his representative shall inspect the work area and determine if work can proceed. If after inspection of the work area, the Site Health and Safety Manager deems there is a hazard to continuing work in the area, the Site Health and Safety Manager will issue a stop work order. Removal of contaminated materials and implementation of the appropriate health and safety plan shall be the responsibility of the contractor, with assistance from local, state, or federal agencies as appropriate.

11.0 Onsite Storage and Dispensing of Flammable and Combustible Liquids

Applicable sections of 29 CM Parts 1926.152 and 1926.153, Health and Safety Regulations for Construction, of the Occupational Health and Safety Act shall be strictly adhered to. The location of any out-of-doors storage tanks shall be approved by PacifiCorp prior to installation.

12.0 Fall Protection

OSHA Fall Protection Standards 29 CFR 1926 Subpart M shall be strictly adhered to. No person or work operation is exempt from the standard on this project. This includes structural steel erection operations and scaffold erectors. Fall protection is required 100 percent of the time, whether climbing, traveling, or working.

Prior to starting work operations that require fall protection, the contractor shall submit to the Site Health and Safety Manager a Fall Protection Plan. The fall protection plan shall include, but not be limited to, the following:

Name of the qualified person in charge of the operation

Description of work operation

List of fall exposures

Description of fall protection methods used to eliminate the fall exposures

Train[redacted]d to ensure employee compliance with the plan

OSH[redacted]oyees are exposed to falls of 6 to 25 feet. For fall hazards of[redacted] 1926.105(a) shall be applicable.

12.1[redacted] Lifelines, and Lanyards

Full[redacted]ines shall be used in accordance with OSHA Standard 1926.[redacted]ons:

Full body harnesses shall be used in lieu of safety belts on this project.

Only lanyards with shock absorbers and locking type snaphooks shall be used.

At least two lanyards shall be used to provide 100 percent fall protection when moving around obstructions, connection points, or other similar items.

12.2 Guardrail Systems

Guardrail systems and their use shall comply with OSHA Standard 1926.502(b), with the following exception:

Manila, plastic, or synthetic rope shall not be used as guardrails on this project.

12.3 Training

The contractor shall provide a training program for each employee who might be exposed to fall hazards. The training program shall be taught by a competent person and shall meet the requirements specified in OSHA Standard 1926.503.

13.0 Scaffold Tagging Procedures

The intent of the scaffold tagging procedure is to assure that personnel perform their work from a scaffold that is complete and constructed in accordance with Project Health and Safety Rules and OSHA regulations. If there is a conflict between Project Health and Safety Rules,

contractor's Safety Program rules, and governmental regulations, the most restrictive rules shall apply. It is the policy of PacifiCorp that all onsite personnel shall comply with this scaffold tagging procedure. Scaffolds not displaying a signed scaffold tag shall not be used.

In addition to the procedures contained in this scaffold tagging procedure, all employees are subject to the OSHA scaffold requirements contained in 29 CFR 1926.451.

Requirements:

Contractors are responsible to ensure their subcontractors tag their scaffolds in accordance with th[redacted].

Scaff[redacted]ontractor and shall conform to the following color codes.

All s[redacted]f the following tags:

G[redacted] to meet federal OSHA scaffold regulations; it is safe to us[redacted]

Ye[redacted] meet federal OSHA scaffold regulations; safety belts sh[redacted]

Re[redacted] not complete. DO NOT USE.

The foreman whose crew constructed the scaffold shall inspect the scaffold for compliance with project and OSHA requirement (1926.451), and shall sign his name to the tag.

All scaffolds that cannot be equipped with standard top rail, midrail, and toeboard because of interferences with structures or equipment shall be marked with a yellow tag stating that "Body Harness Must Be Used."

Scaffolds being constructed, torn down or incomplete shall be marked with a red tag.

Responsibilities:

The foreman who constructs the scaffold or has the scaffold constructed is responsible to ensure that the scaffold is built to project and OSHA standards.

Contractor personnel shall periodically monitor all scaffolds. The audit shall ensure that all scaffolds are properly tagged and in compliance with project and OSHA standards.

In the event that a foreman wishes to use another contractor's or crew's scaffold, the foreman shall obtain permission to use the scaffold and shall inspect and tag the scaffold before use.

Any employee working from a scaffold that does not have a scaffold tag or any supervisor assigning employees to work on an untagged scaffold shall be subject to disciplinary action.

14.0 Confined Space Entry Procedure

Definition of Confined Space: A tank, vessel, silo, vault, pit, open topped space more than 4 feet (1.2 m) deep, pipeline, duct, sewer, or tunnel having limited means of access/egress and/or not designed for continuous employee occupancy and/or having one or more of the following characteristics:

Less than 19.5 percent oxygen

Flammable/combustible/explosive atmospheres present or able to be generated or enter into an area

Toxic [redacted] generated or enter into an area

Area [redacted] ter, gas, sand, gravel, ore, grain, coal, radiation, co[redacted] stance which could possibly trap, suffocate, or harm a pe[redacted]

Poor [redacted]

Resti[redacted]

The i[redacted] Procedure is to assure that personnel who perform work in a confined space are in compliance with Project Safety and governmental regulations. If there is a conflict between Project Health and Safety Rules, contractor's Safety Program rules, and governmental regulations, the most restrictive rules shall apply.

It is the policy of PacifiCorp that all onsite personnel shall comply with this Confined Space Entry Procedure. All confined spaces shall be authorized for entry by means of a permit. No personnel shall enter a confined space prior to compliance with all permit criteria.

Procedure:

Confined Space Entry Permit forms can be obtained from the Site Health and Safety Manager. The entry permit shall be a three-part form. Contractors shall fill the permit out in full (except the last line) and post the white and blue copies of the forms in a conspicuous location at the entrance to the confined space. If there is more than one entrance to the confined space, all entrances shall be posted with a copy of the permit.

Prior to entry into the confined space, all persons entering the space shall be given a briefing as to the precautions that must be taken.

When the work in the confined space is completed, the person authorizing entry into the confined space shall verify that all persons have exited the confined space and that it is safe to remove the permit. The authorizing person shall then sign, date, and write in the time the permit was removed.

Contractors shall retain the blue copy for their records and shall submit the white original to the Site Health and Safety Officer.

15.0 Trenching and Excavation Notice

Before contractors commence work on any trench or excavation, they shall first submit a completed Trenching and Excavation Notice to the Site Health and Safety Manager. The notice shall be submitted far enough in advance to allow the Site Health and Safety Manager ample time to verify the contractor's submittal. When the Site Health and Safety Managerhas verified the information, they shall sign the notice and return a copy of it to the contractor. When the contractor receives the signed notice, he may commence work.

The [redacted] nt person as defined in OSHA Standard 29 CFR 1926 Subp[redacted] nitor all trench and excavation work.

The s[redacted] fety Manager in no way changes the contractor's respo[redacted] nd utilities and repair of damaged utilities as required by th[redacted] fety Manager shall not be held responsible for the safety requi[redacted] on.

The c[redacted] l be responsible for all safety requirements as stated in OSH[redacted].

16.0 Barrier Identification System

In order to identify particular hazards on the clean-up site uniformly, a barrier identification system has been developed for use by all the contractors working on the clean-up site. The identification system has been developed so that any employee working on the site, regardless of employer, can recognize and avoid a hazard when properly marked. Temporary fencing or barrier tape may be used. The Project Manager or his designee shall authorize both placement and removal of all barriers.

The barriers shall be erected far enough back from the hazard to allow for adequate warning and protection from the hazard. The barrier shall be constructed so that it will stand against adverse weather conditions and construction clean-up traffic.

17.0 Crane-Suspended Work Platform

The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevated work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.

The suspended personnel platform design criteria, platform specifications, platform loading, rigging trial lift, inspection and proof testing, work practices, traveling, and pre-lift meeting shall comply with OSHA Standard 29 CFR 1926.550(g).

18.0 Welding and Cutting

Contractors shall obtain a Hot Work Permit from PacifiCorp prior to welding, cutting, grinding, or performing any other "hot work."

The contractor requesting the permit shall address each item listed on the permit and resolve any problems prior to starting the work. PacifiCorp shall issue the permit to the contractor upon satisfactory completion of all items.

The contractor shall maintain a copy of the permit in the work area until the work is completed. Upon completion of the work, and once it is determined that no fire hazards exist, the contr[redacted]ifiCorp for filing.

19.0 [redacted]rance Procedures

Whe[redacted]pection is performed on machines, equipment, or elect[redacted]the machine, equipment, or electrical circuit stopped and isola[redacted]e energy isolation device(s) for that machine, equipment, or ele[redacted] and tagged out in accordance with a documented proc[redacted]t procedure shall be followed when required. Emp[redacted]rol program must be given training. When contractor empl[redacted] a plant or facility, they must coordinate with PacifiCorp and a[redacted]no employees are endangered. When a group of employees is performing a service, maintenance, or inspection activity, each employee must be afforded protection equivalent to the utilization of individual lockout/tagout.

19.1 Control of Hazardous Energy Procedure (Lockout/Tagout)

This procedure establishes the minimum requirements for the lockout/tagout of energy isolating devices whenever maintenance, servicing, or inspection is done on machines, equipment, or electrical circuits. It shall be used to ensure that the machine, equipment, or electrical circuit is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing, maintenance, or inspection where the unexpected energization or startup of the machine, equipment, or electrical circuit or release of stored energy could cause injury.

All contractors are required to comply with the restrictions and limitations imposed upon them during the use of lockout/tagout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment, which is locked out to perform servicing, maintenance, or inspection, shall not attempt to start, energize, or use that machine or equipment. Failure to follow the control of hazardous energy procedure will result in disciplinary action.

19.2 Sequence of Lockout

1. Notify all affected employees that servicing, maintenance, or inspection is required on a machine, equipment or electrical circuit and that the machine, equipment, or electrical

circuit must be shut down and locked out to perform the servicing, maintenance, or inspection.

2. The authorized employee shall refer to any and all sources to identify the type and magnitude of the energy that the machine, equipment, or electrical circuit utilizes, shall understand the hazards of the energy, and shall know the methods to control energy.

3. If the machine, equipment, or electrical circuit is operating, shut it down by normal stopping procedure (depress stop button, open switch, close valve, etc.).

4. D[redacted]ice(s) so that the machine, equipment, or electrical circuit is

5. L[redacted]e(s) with assigned individual lock(s).

6. S[redacted]hat in capacitors, springs, elevated machine members, r[redacted]ns, and air, gas, steam, or water pressure, etc.) must be d[redacted]s such as grounding, repositioning, blocking, bleeding d

7. E[redacted]nected from the energy source(s) by first checking that r[redacted]fying the isolation of the equipment by operating the p[redacted]ing control(s) or by testing to make certain the equipment will not operate.

CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

8. The machine, equipment, or electrical circuit is now locked out. The employee(s) that installed the lock shall apply tag(s) identifying who locked the piece out, the date, and the time.

19.3 Restoring Equipment to Service

When the servicing, maintenance, or inspection is complete and the machine, equipment, or electrical circuit is ready to return to normal operating condition, the following steps shall be taken:

1. Check the machine, equipment, or electrical circuit and the immediate area around the machine, equipment, or electrical circuit to ensure that nonessential items have been removed and the machine, equipment, or electrical circuit components are operationally intact.

2. Check the work area to ensure that all employees have been safely positioned or removed from the area.

3. Verify that the controls are in neutral.

4. Remove the lockout/tagout devices and re-energize the machine, equipment, or electrical circuit.

   NOTE: The removal of some forms of blocking may require re-energization of the machine before safe removal.

5. Notify affected employees that the servicing, maintenance, or inspection is complete and the machine, equipment or electrical circuit is ready to use.

20.0 Site Security

Emp[redacted]ees will be provided designated parking.

Emp[redacted]time while leaving the clean-up site.

An e[redacted]contractor and employees to use.

A sec[redacted]the clean-up site for security reasons.

Neith[redacted]ble for lost or stolen material and equipment.

Illega[redacted]losives are prohibited from the worksite.

21.0 Monthly Reporting

Each month, each subcontractor is required to submit a Monthly Man-hour Summary Report to the project manager. This report will contain statistical data on all first aid cases, recordable incidents, and lost time accidents. The report will provide frequency rates and incident rate, as well as severity.

Appendix D
Safety Audit Criteria

Appendix D

Health and Safety Audit Criteria

The purpose of the health and safety audit is to provide PacifiCorp and subcontractors "leading indicators " to verify field compliance with health and safety practices and procedures and feed this information back to improve field practices on all construction projects.

1.0 Methodology

Field [redacted] es and procedures using these specific criteria.

Whe [redacted] companied by PacifiCorp health and safety personnel as [redacted] dited.

Feed [redacted] fety field personnel in a timely fashion. (If a serious pr [redacted] ll be relayed to a Health and Safety Manager im

Whe [redacted] subcontractor performing the work.

Obse [redacted] data accumulated for a particular general practice or pr

Results of the audits will be fed back to the appropriate personnel or subcontractor in order to achieve timely and consistent improvement in a general practice or procedure.

2.0 Audit Criteria

Specific criteria for each of the general practices/procedures to be audited can be found on the attached sheets. These specific criteria outline areas which field auditors should be focusing on in the field and are the basis for determining if an observation is in or out of compliance.

Fall Protection

Personal Protective Equipment

Ladder and Lift Use

Hazardous Materials

Confined Space

Lockout/Tagout and Electrical Hot Work

Electrical (grounding, etc.)/Fire Protection and Hot Work

Scaffolding

3.0 Fall Protection Audit Criteria

A "fall protection system" is used whenever work is being performed at a height above 6 feet. The feet of a worker comprise the point of measurement for the 6-foot rule.

Fall protection may be accomplished by use of the following systems:

- Ladders, lift units, and scaffolding qualify as fall protection as long as the body of the worker remains in the plane of the equipment/structure and the equipment/structure is properly set up and secured.
- [redacted]oints, nets, and vertical lines must be properly located, [redacted]umentation is required for static line installations.
- [redacted]ncluding lanyards and full body harnesses are approved

Posit[redacted]ized to ensure that no more than six feet of free-fall can oc[redacted]an six feet of free fall can occur is when a worker "walks ou[redacted]

Exce[redacted]lane of a properly installed ladder, fall protection is not requ[redacted]

4.0 Ladder and Lift Audit Criteria

Ladders:

Commercial grade ladders only.

Structural defects are repaired immediately or "DO NOT USE" label attached conspicuously.

Secured against accidental movement by:

- Access ladders tied off
- Set on a stable base
- Set at safe climbing angle: 4:1 ratio or 70 degrees
- Worker retains three points of contact with ladder
- Tools and equipment are not hand-carried while climbing
- Body remains in plane of ladder

- Top two rungs not used

Forklifts:

Platforms are approved and secured to unit

Operator remains at controls

Manbaskets and Cranes:

Critical Lift Plan has been filed with PacifiCorp

Ann

Daily

Aeri

Pers

Equi on (no leaks, operation is smooth)

Trav sible or overhead obstructions are taken into account

Load is under maximum rating

Guardrails and toeboards in place and used; gate secured

Platform height not extended through use of ladders, platforms, planks or other devices

Full body harness and lanyard used (boom-extended lifts only)

Fueling performed with engine off

Battery recharge occurs in clean, well ventilated, flame free area

Housekeeping on platforms adequate to prevent slips and falls and material falling on workers below

5.0 Personal Protective Equipment Audit Criteria

Eye Protection:

Safety glasses or goggles meeting the ANSI Z87.1 standard must be worn in all work zones.

Sideshields shall be fixed and meet ANSI Z87.1 requirements.

High eye injury potential work (welding, grinding, cutting brick or steel, etc.) requires additional eye and face protection such as a face shield or welders goggles.

Foot Protection:

Work boots must be steel-toed and must meet the ANSI Z41.1 requirement.

Head Protection:

Approved hard hats are required in the construction zone.(ANSI Z89.1)

Hard

Hand

Heav materials that present a cut hazard.

6.0 udit Criteria

Stora

Mate and within secondary containment. (Exceptions are gr low environmental toxicity (latex paint) upon the dis ty Manager.)

Incompatible materials are separated.

Leaks and drips are not apparent.

Use:

Workers are using appropriate personal protection equipment.

Engineering controls (ventilation) or administrative controls are implemented where necessary.

Lids and caps are secured on containers when not in immediate use.

Leaks and drips are not apparent.

Training, Labeling and Material Safety Data Sheets (MSDSs):

All containers are clearly labeled for contents and hazards.

MSDSs are on site or at the subcontractor's office area.

"No Smoking" signs are posted and observed around flammable and combustible materials.

7.0 Confined Space Audit Criteria

Confined spaces, including manholes, tanks, rooms under construction, excavations, etc., have been evaluated and classified as permit or non-permit required.

A confined space entry plan form has been completed and is current.

When chemicals are planned for use as part of the entry, the Project Manager has approved and signed approval.

Lockout/tagout procedures are used where required and a double valve system is used to pr[redacted]e.

Conf[redacted]icating "Danger" and "Entry by Permission Only."

8.0 [redacted]trical Hot Work Audit Criteria

A Lo[redacted]pleted and is current for work being performed.

Subc[redacted]/tagout procedure that is written and compliant and at lea[redacted]an.

Lock[redacted]evice until the job is completely finished and all po[redacted]ergy is removed.

One lock and tag per worker working on the job is installed on the lockout device. Each lock is under the exclusive control of a worker and tags are identified with the worker's name and date of work.

9.0 Electrical/Fire Protection & Hot Work Audit Criteria

Electrical:

Maintenance of electrical equipment shall be achieved:

Through the use of Ground Fault Circuit Interrupters (GFCIs).

Defective equipment shall be tagged and removed from service.

Only construction grade extension cords are used.

Cords are strung overhead.

Fire Protection & Hot Work:

Fire extinguishers are provided throughout the area and locally in specific hot work areas.

A current hot work permit has been issued and posted.

A fire watch is being performed if so required by the permit.

Combustible and flammable materials do not provide fuel to a potential fire.

Welding shields are in place.

10.0 Scaffolding Audit Criteria

A Scaffold Plan has been filled out for any scaffolding exceeding 20 feet and a PacifiCorp health and safety staff person prior to use shall approve all scaffolding.

Scaff[redacted]evel ground.

- [redacted]re provided.

Scaff[redacted] power lines.

- [redacted]a has approved use by multiple contractors and each contr[redacted].

A co[redacted]pections on scaffolds.

- [redacted]nd put out of use.

Access ladders should not exceed 20 feet without a break.

Cross braces shall not be used for climbing.

Suspension scaffolds require an independent safety line for each employee who shall wear a full body harness.

Planks, guardrails, and toe boards are installed in compliance with OSHA requirements and in good condition.

Loads do not exceed ratings (light use 25 lb/sq. ft.; medium 50 lb/sq. ft. and heavy 75 lb/sq. ft.).

Scaffolds are braced at appropriate ratios (4:1 for metal, 3:1 for aluminum).

Tower scaffolds will not exceed four times the smallest base dimension.

Scaffolding will be secured to structures every 30 feet horizontally and every 26 feet vertically.

Personnel shall not ride rolling scaffolds.